STIC Search Report
EIC 2100

USPTO

STIC Database Tracking Number: 201575

TO:	From:
Susan F Rayyan Location: RND 3C05 Art Unit: 2167 Friday, September 15, 2006 Case Serial Number: 10/500864	Lance Sealey Location: EIC 2100 RND-4B11 Phone: 571-272-8666 Lance.Sealey@uspto.gov

Search Notes

Dear Susan,

After a fast-and-focused search and machine-translating the two Japanese patents you specified, I was not able to find a data management method that left a remainder offset after a stream file was erased.
Please let me know if you have any questions.

Lance

sira
Search and Information Resources Administration

201575

STIC
Scientific & Technical Information Center

STIC EIC 2100
Search Request Form

Today's Date: 9/14/06

What date would you like to use to limit the search?
Priority Date: 12/9/02 Other:

Name Susan Bayard
AU 2167 Examiner # 77889
Room # 3C Phone 1675
Serial # 10/500,864

Format for Search Results (Circle One):
(PAPER) DISK EMAIL

Where have you searched so far?
(USP) DWPI EPO JPO (ACM) IBM TDB
(IEEE) INSPEC SPI Other _____

Is this a "Fast & Focused" Search Request? (Circle One) (YES) NO
A "Fast & Focused" Search is completed in 2-3 hours (maximum). The search must be on a very specific topic and meet certain criteria. The criteria are posted in EIC2100 and on the EIC2100 NPL Web Page at http://ptoweb/patents/stic/stic-tc2100.htm.

What is the topic, novelty, motivation, utility, or other specific details defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, definitions, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract, background, brief summary, pertinent claims and any citations of relevant art you have found.

Is this request for a BOARD of APPEALS case? (Circle One) YES (NO)

Data editing,
Portable recording mediums (optical discs, mini-disc)
+ track managing data file.
Data recorded unit of file
Erasing one of tracks
offset region(file) provided at beginning of stream data
+ following stream data
last end position of the data part of object erased.

FAT

Inventor:
Manabu Kii
high-density
mini disk drive

track division / track erasure.

STIC Searcher LANCE SEALEY Phone 2-8666
Date picked up 9/14/06 Date Completed 9/14/06

sira
Search and Information Resources Administration

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Set     Items   Description
S1     184954   FILE? ? OR DATASET? ? OR DATA()SET? ?
S2    1414203   ((STREAM??? OR FLOW??? OR FRAMES OR CLIPS OR SEGMENTS OR M-
             ACROBLOCKS OR VIDEOFRAMES OR PACKET? ?)(3N)(DATA OR INFORMATI-
             ON OR MEDIA)) OR CONTENT OR (TELEVISION OR TV OR TELE()VISION
             OR TELLY)()(PROGRAM? ? OR SHOW? ?) OR BALLGAME? ? OR GAME? ? -
             OR ATHLETIC()
S3       8177   S1(3N)S2
S4        164   (ERAS??? OR DELET??? OR REMOV? OR PURG? OR RID? OR CLEAR? -
             OR CLEAN? OR FLUSH? OR ELIMINAT??? OR RELEAS??? OR RELINQUISH-
             ????)(5N)S3
S5     647879   LEAV??? OR LEFT
S6      82508   ((BEGIN???? OR FRONT)(3N)S1) OR ((END??? OR BACK OR LAST OR
              LATTER)(3N)S1) OR (HIDDEN()S1) OR (OFFSET? ?(3N)S1) OR ((PAR-
             T? ? OR PORTION? ? OR SECTION? ? OR BLOCK? ?)(3N)S1) OR FAT OR
              FAT16 OR FAT32 OR EA OR (S1()ALLOCAT???()TABLE? ?) OR HPFS OR
              NTFS
S7          1   S4 AND S5 AND S6
S8          1   AU=((KII M? OR KII, M?) AND (KAWAKAMI T? OR KAWAKAMI, T?) -
             AND (OHBI S? OR OHBI, S?) AND (KAIHOKO T? OR KAIHOKO, T?))
S9         16   (AU=(KII M? OR KII, M? OR KAWAKAMI T? OR KAWAKAMI, T? OR O-
             HBI S? OR OHBI, S? OR KAIHOKO T? OR KAIHOKO, T?) AND S6) NOT -
             (S8 OR AD=(20011209:20041209) OR AD=(20041210:20061214))
S10        62   S4 AND (MC=W04 OR IC=(G06F-012/00 OR G11B-027/00 OR G11B-0-
             20/12 OR G11B-027/34 OR H04N-005/91))
S11        23   S10 NOT (S8:S9 OR AD=(20011209:20041209) OR AD=(20041210:2-
             0061214))
? show files
File 347:JAPIO Dec 1976-2005/Dec(Updated 060404)
         (c) 2006 JPO & JAPIO
File 350:Derwent WPIX 1963-2006/UD=200658
         (c) 2006 The Thomson Corporation
?
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  248512  STREAM???
 1589209  FLOW???
  160907  FRAMES
   30844  CLIPS
  113505  SEGMENTS
     832  MACROBLOCKS
      11  VIDEOFRAMES
   99428  PACKET? ?
 1903661  DATA
 2128202  INFORMATION
  154850  MEDIA
  101230  ((((((STREAM??? OR FLOW???) OR FRAMES) OR CLIPS) OR
          SEGMENTS) OR MACROBLOCKS) OR VIDEOFRAMES) OR PACKET?
          ?)...
  672035  CONTENT
  372395  TELEVISION
  123127  TV
    3662  TELE
   25734  VISION
      30  TELE(W)VISION
       4  TELLY
  570445  PROGRAM? ?
 4034028  SHOW? ?
    6102  (((TELEVISION OR TV) OR TELE(W)VISION) OR
          TELLY)(W)(PROGRAM? ? OR SHOW? ?)
      27  BALLGAME? ?
  178142  GAME? ?
    5078  ATHLETIC
  121577  EVENT? ?
     167  ATHLETIC(W)EVENT? ?
     228  TELECAST? ?
    9700  MOVIE? ?
  518526  VIDEO? ?
S2 1414203  ((STREAM??? OR FLOW??? OR FRAMES OR CLIPS OR SEGMENTS OR
          MACROBLOCKS OR VIDEOFRAMES OR PACKET? ?)(3N)(DATA OR
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          BALLGAME? ? OR GAME? ? OR ATHLETIC()EVENT? ? OR TELECAST?
          ? OR MOVIE? ? OR VIDEO? ?
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8/5/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0014683186 - Drawing available
WPI ACC NO: 2005-030773/200503
XRPX Acc No: N2005-026600
Data edition method involves executing edition of division and erase track by track by rewriting content of track management information which defines each track in track management data file
Patent Assignee: SONY CORP (SONY)
Inventor: **KAIHOKO T** ; **KAWAKAMI T** ; **KII M** ; **OHBI S** ; OUBI S; SHIROI M
Patent Family (6 patents, 35 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	
WO 2004053876	A1	20040624	WO 2003JP15533	A	20031204	200503	B
EP 1473728	A1	20041103	EP 2003777246	A	20031204	200503	E
			WO 2003JP15533	A	20031204		
JP 2004192685	A	20040708	JP 2002357159	A	20021209	200503	E
US 20050091442	A1	20050428	WO 2003JP15533	A	20031204	200531	E
			US 2004500864	A	20040721		
CN 1692441	A	20051102	CN 2003100207	A	20031204	200622	E
KR 2005083549	A	20050826	WO 2003JP15533	A	20031204	200644	E
			KR 2004711986	A	20040803		

Priority Applications (no., kind, date): JP 2002357159 A 20021209

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
WO 2004053876	A1	JA	101	22	

National Designated States,Original: CN KR US
Regional Designated States,Original: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR

EP 1473728	A1	EN			PCT Application WO 2003JP15533 Based on OPI patent WO 2004053876

Regional Designated States,Original: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR

JP 2004192685	A	JA	41		
US 20050091442	A1	EN			PCT Application WO 2003JP15533
KR 2005083549	A	KO			PCT Application WO 2003JP15533 Based on OPI patent WO 2004053876

Alerting Abstract WO A1

NOVELTY - The stream data recorded on the recording medium is managed track by track using a management data file managed by a file system. The edition of division and erase is executed track by track by rewriting the content of the track management information which defines each track in the track management data file.

DESCRIPTION - An INDEPENDENT CLAIM is also included for data edition device.

USE - For editing data recorded on recording medium.

ADVANTAGE - Enables reduction of load of edition processing of stream data recorded on the recording medium and realizes higher speed edition. Eliminates the need to overwrite the film system when division or erase edition is executed track by track.

DESCRIPTION OF DRAWINGS - The figure shows the explanatory diagram of audio-video track index files. (Drawing includes non-English language text).

A file name
B content data
C,D tracks
E data start position

F1 reproduction time

Title Terms/Index Terms/Additional Words: DATA; EDIT; METHOD; EXECUTE; DIVIDE; ERASE; TRACK; REWRITING; CONTENT; MANAGEMENT; INFORMATION; DEFINE ; FILE

Class Codes

International Classification (Main): G11B-027/00, G11B-020/12
(Additional/Secondary): G11B-027/034, H04N-005/91
International Classification (+ Attributes)

IPC + Level	Value	Position	Status	Version
G11B-0027/034	A	I	R	20060101
G11B-0027/30	A	I	R	20060101
G11B-0027/32	A	I	R	20060101
G11B-0027/34	A	I	R	20060101
G11B-0027/031	C	I	R	20060101
G11B-0027/30	C	I	R	20060101
G11B-0027/32	C	I	R	20060101
G11B-0027/34	C	I	R	20060101

US Classification, Issued: 711100000

File Segment: EPI;
DWPI Class: W04
Manual Codes (EPI/S-X): W04-H01C
?

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            ON OR MEDIA)) OR CONTENT OR (TELEVISION OR TV OR TELE()VISION
            OR TELLY)()(PROGRAM? ? OR SHOW? ?) OR BALLGAME? ? OR GAME? ? -
            OR ATHLETIC()
S3       5455   S1(3N)S2
S4         52   (ERAS??? OR DELET??? OR REMOV? OR PURG? OR RID? OR CLEAR? -
            OR CLEAN? OR FLUSH? OR ELIMINAT??? OR RELEAS??? OR RELINQUISH-
            ????)(5N)S3
S5    1144270   LEAV??? OR LEFT
S6     283782   ((BEGIN???? OR FRONT)(3N)S1) OR ((END??? OR BACK OR LAST OR
             LATTER)(3N)S1) OR (HIDDEN()S1) OR (OFFSET? ?(3N)S1) OR ((PAR-
            T? ? OR PORTION? ? OR SECTION? ? OR BLOCK? ?)(3N)S1) OR FAT OR
             FAT16 OR FAT32 OR EA OR (S1()ALLOCAT???()TABLE? ?) OR HPFS OR
             NTFS
S7           0   S4 AND S5 AND S6
S8           0   AU=((KII M? OR KII, M?) AND (KAWAKAMI T? OR KAWAKAMI, T?) -
             AND (OHBI S? OR OHBI, S?) AND (KAIHOKO T? OR KAIHOKO, T?))
S9          11   AU=(KII M? OR KII, M? OR KAWAKAMI T? OR KAWAKAMI, T? OR OH-
            BI S? OR OHBI, S? OR KAIHOKO T? OR KAIHOKO, T?) AND S6 AND (P-
            D<20011209 OR PY<2002)
S10         41   RD S4  (unique items)
S11         25   (S10 AND (PD<20011209 OR PY<2002)) NOT S9
? show files
File   2:INSPEC 1898-2006/Sep W1
         (c) 2006 Institution of Electrical Engineers
File   6:NTIS 1964-2006/Sep W1
         (c) 2006 NTIS, Intl Cpyrght All Rights Res
File   8:Ei Compendex(R) 1970-2006/Sep W1
         (c) 2006 Elsevier Eng.  Info. Inc.
File  34:SciSearch(R) Cited Ref Sci 1990-2006/Sep W1
         (c) 2006 The Thomson Corp
File  35:Dissertation Abs Online 1861-2006/Aug
         (c) 2006 ProQuest Info&Learning
File  56:Computer and Information Systems Abstracts 1966-2006/Aug
         (c) 2006 CSA.
File  57:Electronics & Communications Abstracts 1966-2006/Aug
         (c) 2006 CSA.
File  60:ANTE: Abstracts in New Tech & Engineer 1966-2006/Aug
         (c) 2006 CSA.
File  65:Inside Conferences 1993-2006/Sep 14
         (c) 2006 BLDSC all rts. reserv.
File  94:JICST-EPlus 1985-2006/Jun W1
         (c)2006 Japan Science and Tech Corp(JST)
File  95:TEME-Technology & Management 1989-2006/Sep W2
         (c) 2006 FIZ TECHNIK
File  99:Wilson Appl. Sci & Tech Abs 1983-2006/Jul
         (c) 2006 The HW Wilson Co.
File 111:TGG Natl.Newspaper Index(SM) 1979-2006/Aug 31
         (c) 2006 The Gale Group
File 144:Pascal 1973-2006/Aug W3
         (c) 2006 INIST/CNRS
File 256:TecInfoSource 82-2006/Dec
         (c) 2006 Info.Sources Inc
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
         (c) 2006 The Thomson Corp
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    463799  STREAM???
   3406325  FLOW???
    124406  FRAMES
      9894  CLIPS
    242576  SEGMENTS
      1278  MACROBLOCKS
         5  VIDEOFRAMES
    202163  PACKET? ?
   7823795  DATA
   3976023  INFORMATION
    905519  MEDIA
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   1449247  CONTENT
    352649  TELEVISION
    148543  TV
     16099  TELE
    446584  VISION
        27  TELE(W)VISION
       151  TELLY
   2398312  PROGRAM? ?
   8026501  SHOW? ?
     39779  (((TELEVISION OR TV) OR TELE(W)VISION) OR
            TELLY)(W)(PROGRAM? ? OR SHOW? ?)
       288  BALLGAME? ?
    200209  GAME? ?
     31203  ATHLETIC
    981814  EVENT? ?
       254  ATHLETIC(W)EVENT? ?
      1117  TELECAST? ?
     57792  MOVIE? ?
    473886  VIDEO? ?
S2 2369855  ((STREAM??? OR FLOW??? OR FRAMES OR CLIPS OR SEGMENTS OR
            MACROBLOCKS OR VIDEOFRAMES OR PACKET? ?)(3N)(DATA OR
            INFORMATION OR MEDIA)) OR CONTENT OR (TELEVISION OR TV OR
            TELE()VISION OR TELLY)()(PROGRAM? ? OR SHOW? ?) OR
            BALLGAME? ? OR GAME? ? OR ATHLETIC()EVENT? ? OR TELECAST?
            ? OR MOVIE? ? OR VIDEO? ?
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JP 2000-268539

CLAIMS

[Claim(s)]
[Claim 1] It is the record approach of the compression voice data which is the record approach which classifies compression voice data to the management information section and data division, and records it on a record medium, and said data division consist of two or more small blocks, and is characterized by recording the positional information within said data division of the small block concerned based on the small block managed table recorded on said management information circles.
[Claim 2] The record approach of the compression voice data according to claim 1 characterized by what is recorded as having the information for decoding a code in a small block managed table when compression voice data is enciphered.
[Claim 3] The record edit approach of the variable-length compression voice data characterized by carrying out record edit of the compression voice data at data division so that the voice data length when developing any small block may become the same, when the small block which constitutes data division according to claim 1 is compressed by the variable-length-coding method. Then, the record edit approach that it is the description that can also equalize edit precision and edit of variable-length compression voice data will become easy if division and association of data division are performed in a small block unit.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to record and edit of the encoded audio signal.
[0002]
[Description of the Prior Art] When treating compression voice data conventionally, the fixed-length-coding method was used in many cases. Since it can convert by count with simple the playback time of day and the data location of a frame of each frame when developing the compression voice data compressed using the fixed-length-coding method and reproducing as a sound, it is because it becomes possible to access easily the compression voice data of the time of day of arbitration, and to reproduce. Moreover, if such a fixed-length-coding method is used, since it can ask for a data location by count, the information for managing playback time amount is also unnecessary.
[0003]
[Problem(s) to be Solved by the Invention] On the other hand, when a variable-length-coding method was used, it was very difficult to access the compression voice data of the playback time of day of each frame, and the time of day of the reason which cannot ask for the data location of the frame by count, and arbitration.
[0004] Then, this invention searches variable-length compressed data at a high speed, and aims at enabling division and association to coincidence.
[0005] Moreover, also to the enciphered variable-length compressed data, it searches at a high speed and aims at enabling division and association to coincidence.
[0006]
[Means for Solving the Problem] Invention indicated by claim 1 is the record approach which classifies compression voice data to the management-information section and data division, and records it on a record medium, and is the record approach of the compression voice data which said data division consist of two or more small blocks, and is characterized by to record the positional information within said data division of the small block concerned based on the small block managed table recorded on said management-information circles.

[0007] In claim 1 publication, invention indicated by claim 2 is the record approach of the compression voice data characterized by what is recorded as having the information for decoding a code in a small block managed table, when compression voice data is enciphered.
[0008] Invention indicated by claim 3 is the record edit approach of the variable-length compression voice data characterized by carrying out record edit of the compression voice data at data division so that the voice data length when developing any small block may become the same, when the small block which constitutes data division according to claim 1 is compressed by the variable-length-coding method.
[0009]
[Embodiment of the Invention] (Gestalt 1 of operation) The operation gestalt of this invention is hereafter explained to a detail, referring to a drawing.
[0010] As shown in drawing 1 , the case where the sound signal 101 of the monophonic recording for 300 seconds sampled and quantized by 44.1kHz and 16 bits is compressed by the MPEG 2-AAC method (it is hereafter written as an AAC method) of 128kbps is considered. ****** compressed with an AAC method is set to AAC102 in drawing 1 .
[0011] By the AAC method, a coding train (it considers as the compression frame 103 below) with various code length is outputted for every frame, using 1024 samples of speech information 101 as one frame. What connected this compression frame 103 is called bit stream 104. In the case of the above-mentioned conditions, since one frame becomes 23.2 mses, the compression frame 103 is outputted every 23.2 mses. 16 K bytes of an average of 128 kbps(es)103, i.e., compression frame, are generated for every time amount of this.
[0012] However, since it is an AAC method, with a certain compression frame 103, 8 bytes and the compression frame 103 of various magnitude like 72 K bytes with another compression frame 103 may be generated.
[0013] In order to divide into two bit streams, to combine two bit streams or to realize accessing a high speed in the location of the arbitration of a bit stream in the middle of a bit stream 104, the concept of a part for the pars convoluta lobuli corticalis renis 201 is introduced.
[0014] In a part for the pars convoluta lobuli corticalis renis 201, drawing 2 summarizes 43 compression frames 202, and it carries out alignment of it so that it may become 512 bytes of integral multiple. Although 512 bytes naturally may not be fulfilled when performing alignment, it puts into the part which the padding packet 206 is not then filled. A padding packet is information skipped with AAC decryption equipment 301 (refer to drawing 3). That is, even if the padding packet 206 is contained, a decode sound signal is not affected at all. Moreover, a part for the pars convoluta lobuli corticalis renis 201 is used as 300 seconds, and what was collected 300 pieces is used as the music data 203.
[0015] Although one pars convoluta lobuli corticalis renis 201 consists of 43 compression frames, it is equivalent to this having compressed the sound signal for 1 second by the AAC method. If it puts in another way, if expansion with an AAC method is carried out, it will become the voice data for 1 second about a part for the pars convoluta lobuli corticalis renis 201. That for which the amount of [201 / two or more] pars convoluta lobuli corticalis renis gathered will be called music data 203, and the die length for the pars convoluta lobuli corticalis renis 201 will be called pars-convoluta-lobuli-corticalis-renis part length 204. Although it becomes a repeat, the pars-convoluta-lobuli-corticalis-renis part length 204 is the magnitude of 512 bytes of integral multiple.
[0016] As shown in drawing 3 , a part for the pars convoluta lobuli corticalis renis 201 can be decoded to a sound signal with AAC decryption equipment 301.
[0017] When the amount of [a part for the pars convoluta lobuli corticalis renis A302 with a die length of 512 bytes and / with a die length of 5120 bytes / B304] pars convoluta lobuli corticalis renis is now and it lets these pass to AAC decryption equipment 301, from a part for the pars convoluta lobuli corticalis renis B304, the decode sound signal 305 is acquired for the decode sound signal 303 from a part for the pars convoluta lobuli corticalis renis A302. In the pars-convoluta-lobuli-corticalis-renis part A inputted into AAC decryption equipment 301, and the pars-convoluta-lobuli-corticalis-renis part B, although magnitude completely differs, the decode sound signals 303 and 305 both become data for 1 second. The concept of a part for the pars convoluta lobuli corticalis renis 201 with the above properties is used, and how to access a high speed to edit of a bit stream or the location of arbitration is explained using drawing 8 from drawing 4 . In addition, although the frame number which constitutes a part for the pars convoluta lobuli corticalis renis from a gestalt of this operation was set to 43, you may constitute from ten frames and may constitute from another number of arbitration.
[0018] As shown in drawing 4 and drawing 5 , in order to manage the music data 203, the music management information section 401 is formed, and the whole information 402 and the pars-convoluta-lobuli-corticalis-renis part management information table 403 are contained in it.
[0019] The whole information 402 consists of a pars-convoluta-lobuli-corticalis-renis fraction 404 contained in music data, and a frame number 405 which constitutes a part for the pars convoluta lobuli corticalis renis. The frame number 405 which constitutes a part for the pars convoluta lobuli corticalis renis to the music data 203 stated with the gestalt of this operation is

43, and the pars-convoluta-lobuli-corticalis-renis fraction contained in music data is 300.
[0020] The pars-convoluta-lobuli-corticalis-renis part management information table 403 has the information of the playback start time 406, a starting address 407, and the pars-convoluta-lobuli-corticalis-renis part length 408 to a part for each pars convoluta lobuli corticalis renis, and describes a part for all the pars convoluta lobuli corticalis renis contained in the music data 203 in them. In other words, one line of the pars-convoluta-lobuli-corticalis-renis part management information table 403 becomes the playback start time for each pars convoluta lobuli corticalis renis, a starting address, and pars-convoluta-lobuli-corticalis-renis part length. These four information is made the pars-convoluta-lobuli-corticalis-renis part management information 409.
[0021] Here, it has recorded whether the amount of each pars convoluta lobuli corticalis renis is equivalent to the time of day for the how many seconds from the head of the music data 203 on the playback start time 406. The starting address 407 shows on which location in the music data 203 a part for each pars convoluta lobuli corticalis renis is recorded, using the head of music data as 0. The pars-convoluta-lobuli-corticalis-renis part length 408 is the die length for each pars convoluta lobuli corticalis renis. Moreover, a decryption key is information used in order to decode the code applied to a part for the pars convoluta lobuli corticalis renis, when enciphered for a part for every pars convoluta lobuli corticalis renis. The edit of music data and high random access which were enciphered by holding this for a part for every pars convoluta lobuli corticalis renis become possible.
[0022] Moreover, what is necessary is just to transpose to the correction pars-convoluta-lobuli-corticalis-renis part management information table showing the pars-convoluta-lobuli-corticalis-renis part management information table 403 in the pars-convoluta-lobuli-corticalis-renis part management information section 401 in drawing 6 , when the music data 203 are enciphered.
[0023] It is the difference from the pars-convoluta-lobuli-corticalis-renis part management information table 403 that the correction pars-convoluta-lobuli-corticalis-renis part management information table shown in drawing 6 has the information on the decryption key 502 for decoding the code for each pars convoluta lobuli corticalis renis in addition to the same playback start time 406 as the pars-convoluta-lobuli-corticalis-renis part management information table 403, a starting address 407, and the pars-convoluta-lobuli-corticalis-renis part length 408.
[0024] Next, the case where a high speed is accessed is explained using drawing 4 to the place to which it went for 120 seconds from the head of the music data 203 which are not enciphered using the music management information section 401.
[0025] 120 second after [the head of music to], it becomes the parts for the 120th pars convoluta lobuli corticalis renis from the head of music. A starting address is [4000 and pars-convoluta-lobuli-corticalis-renis part length] 29 when the 120th pars-convoluta-lobuli-corticalis-renis part information is referred to from the pars-convoluta-lobuli-corticalis-renis part management information table 403. In this way, since the address which should access in music data was acquirable, a decode sound signal can be acquired in inputting a part for the pars convoluta lobuli corticalis renis in the 4000 addresses into AAC decryption equipment 301.
[0026] Moreover, when the music data 203 are enciphered, the correction pars-convoluta-lobuli-corticalis-renis part management information table shown in drawing 6 instead of the pars-convoluta-lobuli-corticalis-renis part management information table 403 of drawing 4 is used. After asking for the 200th decryption key 502 for the pars convoluta lobuli corticalis renis from the correction pars-convoluta-lobuli-corticalis-renis part management information table shown in drawing 6 and decoding the 200th code for the pars convoluta lobuli corticalis renis using the decryption key 502 to access 200 seconds later, by the same approach as the access approach for the music data which are not enciphered, a part for the pars convoluta lobuli corticalis renis can be inputted into AAC decryption equipment 301, and decode speech information can be obtained. Moreover, since it is not necessary to search music data 203 body with this access approach, a high speed can be accessed in the location of the arbitration of the music data 203.
[0027] Next, the approach of division in case the music data 203 are not enciphered is explained using drawing 4 , drawing 5 , and drawing 7 .
[0028] It considers dividing the music data 203 when not being enciphered into two music data bordering on 200 seconds.
[0029] Let [the pars-convoluta-lobuli-corticalis-renis part management information table 401 of drawing 4 used when the music data 203 are not enciphered] 100 pieces be the pars-convoluta-lobuli-corticalis-renis part management information table B602 for 200 pieces the pars-convoluta-lobuli-corticalis-renis part management information table A601 and the second half in the first half of the pars-convoluta-lobuli-corticalis-renis part management information table 401 by dividing into two by the 200th. At this time, 5600 which is the 200th starting address 407 is acquired to coincidence.
[0030] Although the pars-convoluta-lobuli-corticalis-renis part management information table A601 remains as it is and it becomes the pars-convoluta-lobuli-corticalis-renis part management information table D603 which is a pars-convoluta-lobuli-corticalis-renis part management information table after division, the pars-convoluta-lobuli-corticalis-renis part management information table B602 turns into the pars-convoluta-lobuli-corticalis-renis part management information table D604 which is

a pars-convoluta-lobuli-corticalis-renis part management information table after division, after correcting playback start time and a starting address.
[0031] Therefore, 200 seconds which is the time of day divided from the playback start time 605 of the pars-convoluta-lobuli-corticalis-renis part management information table B602 are subtracted, and the playback start time 607 of the pars-convoluta-lobuli-corticalis-renis part management information table D comes, and 5600 which is the 200th starting address acquired previously is subtracted, and it becomes the starting address 608 of the pars-convoluta-lobuli-corticalis-renis part management information table D604 from the starting address 606 of the pars-convoluta-lobuli-corticalis-renis part management information table B602.
[0032] Moreover, since the pars-convoluta-lobuli-corticalis-renis fraction after division is set to 200 and 100, respectively, let it be the pars-convoluta-lobuli-corticalis-renis fraction contained in each music data.
[0033] Although the case where the music data 203 were not enciphered was considered here, when enciphered, the above-mentioned pars-convoluta-lobuli-corticalis-renis part management information table 403 only interchanges on a correction pars-convoluta-lobuli-corticalis-renis part management information table, and the procedure is the same as the case where the music data 203 are not enciphered.
[0034] Next, association in case the music data 203 are not enciphered is considered using drawing 8 . However, the frame number which constitutes a part for the pars convoluta lobuli corticalis renis from music data to combine needs to be the same.
[0035] The music data which become in the first half after association consist of 200 pars convoluta lobuli corticalis renis, and the pars-convoluta-lobuli-corticalis-renis part management information table has become as it is shown in the pars-convoluta-lobuli-corticalis-renis part management information table E701.
[0036] Moreover, the thing of the second half consists of 100 pars convoluta lobuli corticalis renis, and the pars-convoluta-lobuli-corticalis-renis part management information table has become as it is shown in the pars-convoluta-lobuli-corticalis-renis part management information table F702.
[0037] 5570 which is 199 seconds and the starting address 707 which are a part for the last pars convoluta lobuli corticalis renis 706 of the pars-convoluta-lobuli-corticalis-renis part management information table E701, i.e., the 200th playback start time, is acquired. Moreover, let the pars-convoluta-lobuli-corticalis-renis part management information table E701 be the pars-convoluta-lobuli-corticalis-renis part management information table G703 which is one of the pars-convoluta-lobuli-corticalis-renis part management information tables in the middle of joint in the condition as it is.
[0038] On the other hand, in order to use the pars-convoluta-lobuli-corticalis-renis part management information table F702 as the pars-convoluta-lobuli-corticalis-renis part management information table H704 in the middle of joint, 199 seconds which is the 200th playback start time 706 of the pars-convoluta-lobuli-corticalis-renis part management information table E701 acquired previously, and 200 seconds which added 1 second are added to the playback start time 709.
[0039] Moreover, 5570 which is the 200th starting address 707 of the pars-convoluta-lobuli-corticalis-renis part management information table E701, and 5600 which added 30 of the pars-convoluta-lobuli-corticalis-renis part length 708 are altogether added to the starting address 711 of the pars-convoluta-lobuli-corticalis-renis part management information table F, and it considers as the starting address 716 of the pars-convoluta-lobuli-corticalis-renis part management information table H at coincidence.
[0040] Moreover, if it changes into the correction pars-convoluta-lobuli-corticalis-renis part management information table on which the key for decryption accompanies the pars-convoluta-lobuli-corticalis-renis part management information table of drawing 8 to the music data 203 in the case of being enciphered, association will be possible by the same approach as the case where it is not enciphered.
[0041]
[Effect of the Invention] According to this invention, a high speed is accessed at the playback time of day of the arbitration of variable-length compression voice data, or dividing and joining together is not concerned with the existence of encryption of variable-length compression voice data, but it becomes possible, and a so-called size has the effectiveness so that more clearly than the above explanation.

TECHNICAL FIELD

[Field of the Invention] This invention relates to record and edit of the encoded audio signal.

PRIOR ART

[Description of the Prior Art] When treating compression voice data conventionally, the fixed-length-coding method was used in many cases. Since it can convert by count with simple the playback time of day and the data location of a frame of each frame when developing the compression voice data compressed using the fixed-length-coding method and reproducing as a sound, it is because it becomes possible to access easily the compression voice data of the time of day of arbitration, and to reproduce. Moreover, if such a fixed-length-coding method is used, since it can ask for a data location by count, the information for managing playback time amount is also unnecessary.

EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, a high speed is accessed at the playback time of day of the arbitration of variable-length compression voice data, or dividing and joining together is not concerned with the existence of encryption of variable-length compression voice data, but it becomes possible, and a so-called size has the effectiveness so that more clearly than the above explanation.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] On the other hand, when a variable-length-coding method was used, it was very difficult to access the compression voice data of the playback time of day of each frame, and the time of day of the reason which cannot ask for the data location of the frame by count, and arbitration.
[0004] Then, this invention searches variable-length compressed data at a high speed, and aims at enabling division and association to coincidence.
[0005] Moreover, also to the enciphered variable-length compressed data, it searches at a high speed and aims at enabling division and association to coincidence.

MEANS

[Means for Solving the Problem] Invention indicated by claim 1 is the record approach which classifies compression voice data to the management-information section and data division, and records it on a record medium, and is the record approach of the compression voice data which said data division consist of two or more small blocks, and is characterized by to record the positional information within said data division of the small block concerned based on the small block managed table recorded on said management-information circles.
[0007] In claim 1 publication, invention indicated by claim 2 is the record approach of the compression voice data characterized by what is recorded as having the information for decoding a code in a small block managed table, when compression voice data is enciphered.
[0008] Invention indicated by claim 3 is the record edit approach of the variable-length compression voice data characterized by carrying out record edit of the compression voice data at data division so that the voice data length when developing any small block may become the same, when the small block which constitutes data division according to claim 1 is compressed by the variable-length-coding method.
[0009]
[Embodiment of the Invention] (Gestalt 1 of operation) The operation gestalt of this invention is hereafter explained to a detail, referring to a drawing.
[0010] As shown in drawing 1 , the case where the sound signal 101 of the monophonic recording for 300 seconds sampled and quantized by 44.1kHz and 16 bits is compressed by the MPEG 2-AAC method (it is hereafter written as an AAC method)

of 128kbps is considered. ****** compressed with an AAC method is set to AAC102 in drawing 1 .
[0011] By the AAC method, a coding train (it considers as the compression frame 103 below) with various code length is outputted for every frame, using 1024 samples of speech information 101 as one frame. What connected this compression frame 103 is called bit stream 104. In the case of the above-mentioned conditions, since one frame becomes 23.2 mses, the compression frame 103 is outputted every 23.2 mses. 16 K bytes of an average of 128 kbps(es)103, i.e., compression frame, are generated for every time amount of this.
[0012] However, since it is an AAC method, with a certain compression frame 103, 8 bytes and the compression frame 103 of various magnitude like 72 K bytes with another compression frame 103 may be generated.
[0013] In order to divide into two bit streams, to combine two bit streams or to realize accessing a high speed in the location of the arbitration of a bit stream in the middle of a bit stream 104, the concept of a part for the pars convoluta lobuli corticalis renis 201 is introduced.
[0014] In a part for the pars convoluta lobuli corticalis renis 201, drawing 2 summarizes 43 compression frames 202, and it carries out alignment of it so that it may become 512 bytes of integral multiple. Although 512 bytes naturally may not be fulfilled when performing alignment, it puts into the part which the padding packet 206 is not then filled. A padding packet is information skipped with AAC decryption equipment 301 (refer to drawing 3). That is, even if the padding packet 206 is contained, a decode sound signal is not affected at all. Moreover, a part for the pars convoluta lobuli corticalis renis 201 is used as 300 seconds, and what was collected 300 pieces is used as the music data 203.
[0015] Although one pars convoluta lobuli corticalis renis 201 consists of 43 compression frames, it is equivalent to this having compressed the sound signal for 1 second by the AAC method. If it puts in another way, if expansion with an AAC method is carried out, it will become the voice data for 1 second about a part for the pars convoluta lobuli corticalis renis 201. That for which the amount of [201 / two or more] pars convoluta lobuli corticalis renis gathered will be called music data 203, and the die length for the pars convoluta lobuli corticalis renis 201 will be called pars-convoluta-lobuli-corticalis-renis part length 204. Although it becomes a repeat, the pars-convoluta-lobuli-corticalis-renis part length 204 is the magnitude of 512 bytes of integral multiple.
[0016] As shown in drawing 3 , a part for the pars convoluta lobuli corticalis renis 201 can be decoded to a sound signal with AAC decryption equipment 301.
[0017] When the amount of [a part for the pars convoluta lobuli corticalis renis A302 with a die length of 512 bytes and / with a die length of 5120 bytes / B304] pars convoluta lobuli corticalis renis is now and it lets these pass to AAC decryption equipment 301, from a part for the pars convoluta lobuli corticalis renis B304, the decode sound signal 305 is acquired for the decode sound signal 303 from a part for the pars convoluta lobuli corticalis renis A302. In the pars-convoluta-lobuli-corticalis-renis part A inputted into AAC decryption equipment 301, and the pars-convoluta-lobuli-corticalis-renis part B, although magnitude completely differs, the decode sound signals 303 and 305 both become data for 1 second. The concept of a part for the pars convoluta lobuli corticalis renis 201 with the above properties is used, and how to access a high speed to edit of a bit stream or the location of arbitration is explained using drawing 8 from drawing 4 . In addition, although the frame number which constitutes a part for the pars convoluta lobuli corticalis renis from a gestalt of this operation was set to 43, you may constitute from ten frames and may constitute from another number of arbitration.
[0018] As shown in drawing 4 and drawing 5 , in order to manage the music data 203, the music management information section 401 is formed, and the whole information 402 and the pars-convoluta-lobuli-corticalis-renis part management information table 403 are contained in it.
[0019] The whole information 402 consists of a pars-convoluta-lobuli-corticalis-renis fraction 404 contained in music data, and a frame number 405 which constitutes a part for the pars convoluta lobuli corticalis renis. The frame number 405 which constitutes a part for the pars convoluta lobuli corticalis renis to the music data 203 stated with the gestalt of this operation is 43, and the pars-convoluta-lobuli-corticalis-renis fraction contained in music data is 300.
[0020] The pars-convoluta-lobuli-corticalis-renis part management information table 403 has the information of the playback start time 406, a starting address 407, and the pars-convoluta-lobuli-corticalis-renis part length 408 to a part for each pars convoluta lobuli corticalis renis, and describes a part for all the pars convoluta lobuli corticalis renis contained in the music data 203 in them. In other words, one line of the pars-convoluta-lobuli-corticalis-renis part management information table 403 becomes the playback start time for each pars convoluta lobuli corticalis renis, a starting address, and pars-convoluta-lobuli-corticalis-renis part length. These four information is made the pars-convoluta-lobuli-corticalis-renis part management information 409.
[0021] Here, it has recorded whether the amount of each pars convoluta lobuli corticalis renis is equivalent to the time of day for the how many seconds from the head of the music data 203 on the playback start time 406. The starting address 407 shows on which location in the music data 203 a part for each pars convoluta lobuli corticalis renis is recorded, using the head of music data as 0. The pars-convoluta-lobuli-corticalis-renis part length 408 is the die length for each pars convoluta lobuli

corticalis renis. Moreover, a decryption key is information used in order to decode the code applied to a part for the pars convoluta lobuli corticalis renis, when enciphered for a part for every pars convoluta lobuli corticalis renis. The edit of music data and high random access which were enciphered by holding this for a part for every pars convoluta lobuli corticalis renis become possible.

[0022] Moreover, what is necessary is just to transpose to the correction pars-convoluta-lobuli-corticalis-renis part management information table showing the pars-convoluta-lobuli-corticalis-renis part management information table 403 in the pars-convoluta-lobuli-corticalis-renis part management information section 401 in drawing 6 , when the music data 203 are enciphered.

[0023] It is the difference from the pars-convoluta-lobuli-corticalis-renis part management information table 403 that the correction pars-convoluta-lobuli-corticalis-renis part management information table shown in drawing 6 has the information on the decryption key 502 for decoding the code for each pars convoluta lobuli corticalis renis in addition to the same playback start time 406 as the pars-convoluta-lobuli-corticalis-renis part management information table 403, a starting address 407, and the pars-convoluta-lobuli-corticalis-renis part length 408.

[0024] Next, the case where a high speed is accessed is explained using drawing 4 to the place to which it went for 120 seconds from the head of the music data 203 which are not enciphered using the music management information section 401.

[0025] 120 second after [the head of music to], it becomes the parts for the 120th pars convoluta lobuli corticalis renis from the head of music. A starting address is [4000 and pars-convoluta-lobuli-corticalis-renis part length] 29 when the 120th pars-convoluta-lobuli-corticalis-renis part information is referred to from the pars-convoluta-lobuli-corticalis-renis part management information table 403. In this way, since the address which should access in music data was acquirable, a decode sound signal can be acquired in inputting a part for the pars convoluta lobuli corticalis renis in the 4000 addresses into AAC decryption equipment 301.

[0026] Moreover, when the music data 203 are enciphered, the correction pars-convoluta-lobuli-corticalis-renis part management information table shown in drawing 6 instead of the pars-convoluta-lobuli-corticalis-renis part management information table 403 of drawing 4 is used. After asking for the 200th decryption key 502 for the pars convoluta lobuli corticalis renis from the correction pars-convoluta-lobuli-corticalis-renis part management information table shown in drawing 6 and decoding the 200th code for the pars convoluta lobuli corticalis renis using the decryption key 502 to access 200 seconds later, by the same approach as the access approach for the music data which are not enciphered, a part for the pars convoluta lobuli corticalis renis can be inputted into AAC decryption equipment 301, and decode speech information can be obtained. Moreover, since it is not necessary to search music data 203 body with this access approach, a high speed can be accessed in the location of the arbitration of the music data 203.

[0027] Next, the approach of division in case the music data 203 are not enciphered is explained using drawing 4 , drawing 5 , and drawing 7 .

[0028] It considers dividing the music data 203 when not being enciphered into two music data bordering on 200 seconds.

[0029] Let [the pars-convoluta-lobuli-corticalis-renis part management information table 401 of drawing 4 used when the music data 203 are not enciphered] 100 pieces be the pars-convoluta-lobuli-corticalis-renis part management information table B602 for 200 pieces the pars-convoluta-lobuli-corticalis-renis part management information table A601 and the second half in the first half of the pars-convoluta-lobuli-corticalis-renis part management information table 401 by dividing into two by the 200th. At this time, 5600 which is the 200th starting address 407 is acquired to coincidence.

[0030] Although the pars-convoluta-lobuli-corticalis-renis part management information table A601 remains as it is and it becomes the pars-convoluta-lobuli-corticalis-renis part management information table D603 which is a pars-convoluta-lobuli-corticalis-renis part management information table after division, the pars-convoluta-lobuli-corticalis-renis part management information table B602 turns into the pars-convoluta-lobuli-corticalis-renis part management information table D604 which is a pars-convoluta-lobuli-corticalis-renis part management information table after division, after correcting playback start time and a starting address.

[0031] Therefore, 200 seconds which is the time of day divided from the playback start time 605 of the pars-convoluta-lobuli-corticalis-renis part management information table B602 are subtracted, and the playback start time 607 of the pars-convoluta-lobuli-corticalis-renis part management information table D comes, and 5600 which is the 200th starting address acquired previously is subtracted, and it becomes the starting address 608 of the pars-convoluta-lobuli-corticalis-renis part management information table D604 from the starting address 606 of the pars-convoluta-lobuli-corticalis-renis part management information table B602.

[0032] Moreover, since the pars-convoluta-lobuli-corticalis-renis fraction after division is set to 200 and 100, respectively, let it be the pars-convoluta-lobuli-corticalis-renis fraction contained in each music data.

[0033] Although the case where the music data 203 were not enciphered was considered here, when enciphered, the above-mentioned pars-convoluta-lobuli-corticalis-renis part management information table 403 only interchanges on a correction

pars-convoluta-lobuli-corticalis-renis part management information table, and the procedure is the same as the case where the music data 203 are not enciphered.

[0034] Next, association in case the music data 203 are not enciphered is considered using drawing 8 . However, the frame number which constitutes a part for the pars convoluta lobuli corticalis renis from music data to combine needs to be the same.

[0035] The music data which become in the first half after association consist of 200 pars convoluta lobuli corticalis renis, and the pars-convoluta-lobuli-corticalis-renis part management information table has become as it is shown in the pars-convoluta-lobuli-corticalis-renis part management information table E701.

[0036] Moreover, the thing of the second half consists of 100 pars convoluta lobuli corticalis renis, and the pars-convoluta-lobuli-corticalis-renis part management information table has become as it is shown in the pars-convoluta-lobuli-corticalis-renis part management information table F702.

[0037] 5570 which is 199 seconds and the starting address 707 which are a part for the last pars convoluta lobuli corticalis renis 706 of the pars-convoluta-lobuli-corticalis-renis part management information table E701, i.e., the 200th playback start time, is acquired. Moreover, let the pars-convoluta-lobuli-corticalis-renis part management information table E701 be the pars-convoluta-lobuli-corticalis-renis part management information table G703 which is one of the pars-convoluta-lobuli-corticalis-renis part management information tables in the middle of joint in the condition as it is.

[0038] On the other hand, in order to use the pars-convoluta-lobuli-corticalis-renis part management information table F702 as the pars-convoluta-lobuli-corticalis-renis part management information table H704 in the middle of joint, 199 seconds which is the 200th playback start time 706 of the pars-convoluta-lobuli-corticalis-renis part management information table E701 acquired previously, and 200 seconds which added 1 second are added to the playback start time 709.

[0039] Moreover, 5570 which is the 200th starting address 707 of the pars-convoluta-lobuli-corticalis-renis part management information table E701, and 5600 which added 30 of the pars-convoluta-lobuli-corticalis-renis part length 708 are altogether added to the starting address 711 of the pars-convoluta-lobuli-corticalis-renis part management information table F, and it considers as the starting address 716 of the pars-convoluta-lobuli-corticalis-renis part management information table H at coincidence.

[0040] Moreover, if it changes into the correction pars-convoluta-lobuli-corticalis-renis part management information table on which the key for decryption accompanies the pars-convoluta-lobuli-corticalis-renis part management information table of drawing 8 to the music data 203 in the case of being enciphered, association will be possible by the same approach as the case where it is not enciphered.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing for explaining compression of the sound signal by AAC

[Drawing 2] Drawing for explaining the relation of a part for the pars convoluta lobuli corticalis renis concerning this operation gestalt, music data, and a compression frame

[Drawing 3] The explanatory view of the AAC decryption equipment concerning this operation gestalt

[Drawing 4] Drawing showing the configuration of the music management information section and an example of a pars-convoluta-lobuli-corticalis-renis part management information table concerning this operation gestalt

[Drawing 5] Drawing showing an example of the configuration of music management information information

[Drawing 6] Drawing showing an example of a pars-convoluta-lobuli-corticalis-renis part management information table to the enciphered music data in this operation gestalt

[Drawing 7] Drawing showing an example of division of the music data concerning this operation gestalt

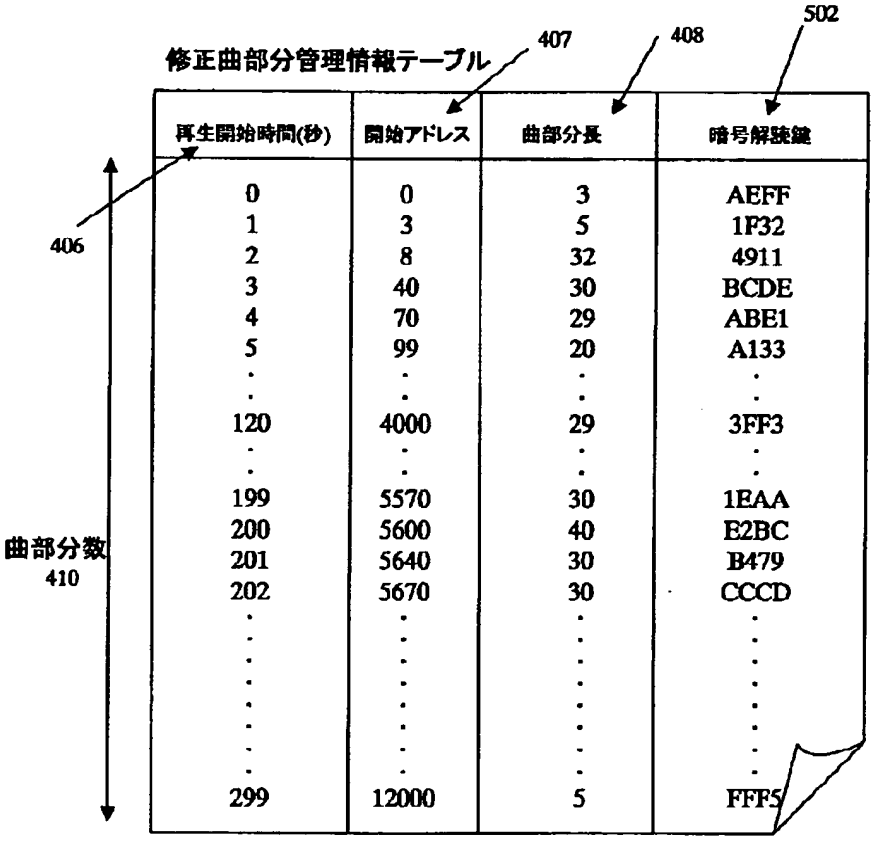
[Drawing 8] Drawing showing an example of association of the music data concerning this operation gestalt

[Description of Notations]

101 Sound Signal
102 AAC
103 Compression Frame
104 Bit Stream
201 A Part for Pars Convoluta Lobuli Corticalis Renis
202 Compression Frame

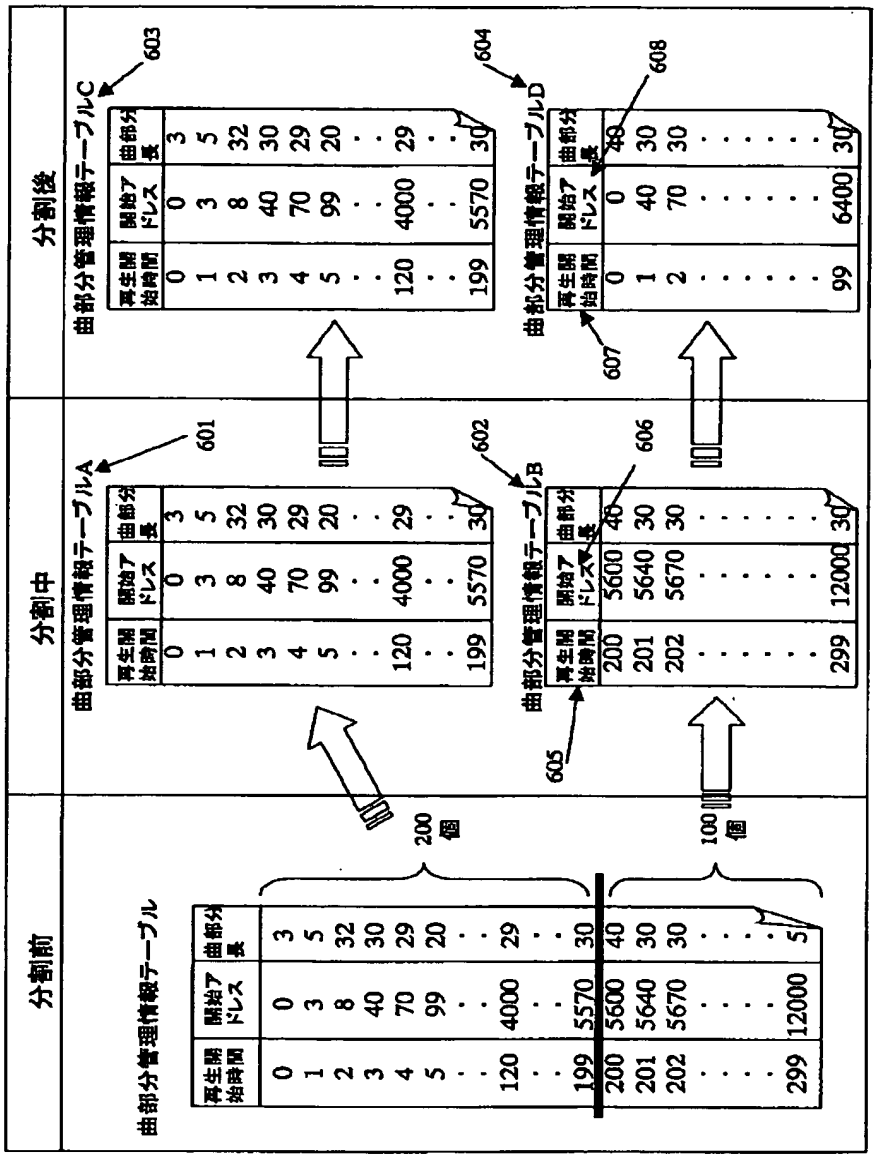
203 Music Data
204 Pars-Convoluta-Lobuli-Corticalis-Renis Part Length
205 Break of Compression Frame
206 Padding Packet
301 AAC Decryption Equipment
302 Pars-Convoluta-Lobuli-Corticalis-Renis Part A
303 Decode Sound Signal A
304 Pars-Convoluta-Lobuli-Corticalis-Renis Part B
305 Decode Sound Signal B
401 Music Management Information Section
402 Whole Information
403 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table
404 Pars-Convoluta-Lobuli-Corticalis-Renis Fraction Contained in Music Data
405 Frame Number Which Constitutes a Part for Pars Convoluta Lobuli Corticalis Renis
406 Playback Start Time
407 Starting Address
408 Pars-Convoluta-Lobuli-Corticalis-Renis Part Length
409 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information
410 Pars-Convoluta-Lobuli-Corticalis-Renis Fraction
501 Correction Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table
502 Decryption Key
601 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table A
602 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table B
603 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table C
604 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table D
605 Playback Start Time
606 Starting Address
607 Playback Start Time
608 Starting Address
701 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table E
702 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table F
703 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table G
704 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table H
705 Pars-Convoluta-Lobuli-Corticalis-Renis Part Management Information Table I
706 Playback Start Time
707 Starting Address
708 Pars-Convoluta-Lobuli-Corticalis-Renis Part Length
709 Playback Start Time
710 Starting Address
711 Pars-Convoluta-Lobuli-Corticalis-Renis Part Length
712 Playback Start Time
713 Starting Address
714 Pars-Convoluta-Lobuli-Corticalis-Renis Part Length
715 Playback Start Time
716 Starting Address
717 Pars-Convoluta-Lobuli-Corticalis-Renis Part Length
718 Playback Start Time
719 Starting Address
720 Pars-Convoluta-Lobuli-Corticalis-Renis Part Length

【図6】

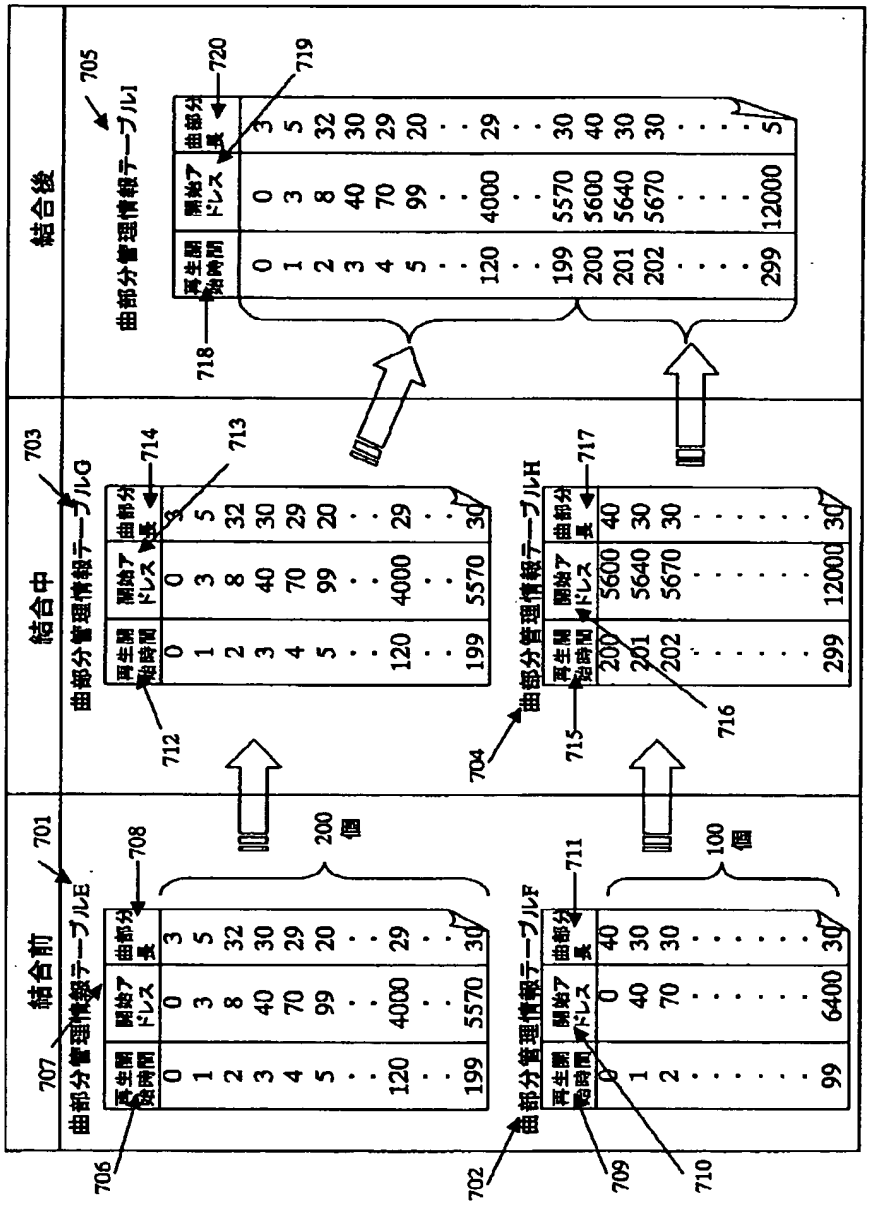


再生開始時間(秒)	開始アドレス	曲部分長	暗号解読鍵
0	0	3	AEFF
1	3	5	1F32
2	8	32	4911
3	40	30	BCDE
4	70	29	ABE1
5	99	20	A133
・	・	・	・
・	・	・	・
120	4000	29	3FF3
・	・	・	・
・	・	・	・
199	5570	30	1EAA
200	5600	40	E2BC
201	5640	30	B479
202	5670	30	CCCD
・	・	・	・
・	・	・	・
・	・	・	・
・	・	・	・
・	・	・	・
・	・	・	・
・	・	・	・
・	・	・	・
299	12000	5	FFF5

【図7】


分割前
分割中
分割後
曲部分管理情報テーブル
曲部分管理情報テーブルA
曲部分管理情報テーブルB
曲部分管理情報テーブルC
曲部分管理情報テーブルD
再生開始時間
開始アドレス
曲部分長
601
602
603
604
605
606
607
608
200個
100個

【図8】



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CLAIMS

[Claim(s)]
[Claim 1] Between a receiving means to receive a digital image sound signal, the record medium, with which it was divided into two or more fields, and the number was matched with each field, the 1st address in this divided 1 field, and the 2nd address While matching a record means to record one program which consists of said digital image sound signals, and said number matched with said one program and said one field A storage means to memorize the table which matches said one program and said 2nd address, An operation means to calculate said 1st address based on said number memorized by said storage means, The record regenerative apparatus characterized by having a playback means to reproduce said one program recorded on said record medium, based on the 1st address which said operation means calculated, and the 2nd address memorized by said table.
[Claim 2] Said record medium is a record regenerative apparatus according to claim 1 characterized by being divided into two or more fields of fixed size.
[Claim 3] It is the record regenerative apparatus according to claim 2 characterized by being divided into two or more fields of fixed size to which said record medium is exchangeable and this record medium does not change with the storage capacity of this record medium.
[Claim 4] It is the record regenerative apparatus according to claim 1 or 2 characterized by being divided into two or more fields of the fixed number to which said record medium is exchangeable and this record medium does not change with the storage capacity of this record medium.
[Claim 5] Between a receiving means to receive a digital image sound signal, the record medium currently divided into two or more exchangeable fields containing different size, the 1st address in this divided 1 field, and the 2nd address A record means to record one program which consists of said digital image sound signals, A storage means to memorize the table which matches said one program, said 1st address, and said 2nd address, The record regenerative apparatus characterized by having a playback means to reproduce said one program recorded on said record medium, based on said 1st address memorized by said storage means and said 2nd address.
[Claim 6] Said record medium is a record regenerative apparatus according to claim 5 characterized by size being divided by the field by the side of the periphery of this record medium so that the direction of the field by the side of inner circumference may become large.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the record regenerative apparatus which receives digital broadcasting, or receives analog broadcasting, changes into a digital image sound signal, and is recorded on a record medium.
[0002]
[Description of the Prior Art] There is a record regenerative apparatus shown in JP,11-39850,A as conventional equipment which can carry out record playback of the MPEG (Moving Pictures Experts Group) stream which is a typical digital image sound signal. Drawing 7 is the example of a configuration of the record regenerative apparatus based on the computer shown in this JP,11-39850,A. In drawing 701 main memory and 703 for a microprocessor and 702 A bus bridge, An I/O (Input/Output) interface and 705 704 A secondary memory interface, It is the memory (VRAM) which said AV processing circuit 708 uses the hard disk by which 706 was connected to said secondary memory interface, the MPEG real-time encoder

board on which 707 built in TV tuner, and 708 for AV processing circuit, and uses 709 for image display processing.
[0003] A microprocessor 701, main memory 702, and a bus bridge 703 are mutually connected through the internal bus, and the remaining block is mutually connected through the expansion bus. The bus bridge 703 is controlling the exchange of the data between an internal bus and expansion buses, such as for example, a PCI (Peripheral Component Interconnect) bus and an ISA (Industry Standard Architecture) bus.
[0004] The secondary memory interface 705, the MPEG real-time encoder board 707, and AV processing circuit 708 are connected to an expansion bus, and the hard disk 706 is connected to said secondary memory interface 705.
[0005] A microprocessor 701 is performing various kinds of application programs recorded on this hard disk 706 under the control of an operating system recorded on the hard disk 706, for example, performs record of an image, playback, edit, decoding, and other predetermined processings.
[0006] The MPEG real-time encoder board 707 is real time, for example, encodes an image and voice based on the specification of MPEG1, contains TV tuner which receives a television broadcasting program, and can carry out MPEG encoding of the program which this TV tuner received.
[0007] AV processing circuit 708 consists of VGA (Video Graphics Array), a three-dimension accelerator (neither is illustrated), etc., and performs the voice output to the graphic display and the loudspeaker to a display. Moreover, AV processing circuit 708 can output the image which contained the NTSC encoder, for example, was based on NTSC system at VTR etc.
[0008] Processing of record of the image of an image, playback, edit, decoding, etc. is made by the application program currently recorded on the hard disk 706. For example, the television broadcasting program received with TV tuner of the MPEG real-time encoder board 707 is encoded to an MPEG stream, and the data is recorded on a hard disk 706 through an expansion bus. Furthermore, it is made as [perform / during the record / playback of the scene of the arbitration of an image / finishing / an image transcription / already / (image) etc.].
[0009] The drawing 7 lower part shows the file system called FAT (File Allocation Table) currently generally used by computer. 710 is a file table and 711 is a cluster table. In 712, an extension train and 714 are the 1st cluster trains, and a file name index and 713 constitute the file table 710 by these. 715 is an entry number index and 716 is FAT. ID train and 717 are cluster number trains, and constitute the cluster table 710 by these.
[0010] The hard disk has the smallest unit of data logging called a sector, for example, in the case of the hard disk of an IDE (Integrated Drive Electronics) method, sector size is 512B (cutting tool). By computer, when recording data on a hard disk, it is common to divide and record [to which a sector is called the collection ** cluster of exponentiation individuals of 2] data for every unit, and the sizes of a cluster are 32kB immobilization and 4kB immobilization in many cases. For example, when the file named abcd.exe is divided into four clusters (the 2nd cluster, 3rd cluster, 5th cluster, and 8th cluster) and is recorded on the hard disk, first, file name "abcd" is stored in the file name index 712 of the file table 710, and "exe" is stored in the extension train 713, respectively. Moreover, the head cluster number (2 which shows the 2nd cluster here) of the cluster currently divided and recorded is stored in the 1st cluster train 714.
[0011] In actually reading the data of file"abcd.exe", it searches the entry to which the 2nd is equivalent cluster 2 out of the entry number index 715 of the cluster table 711. Moreover, FAT of the 2nd entry The following entry number (3 which shows the 3rd cluster here) is stored in the ID train 716. By repeating until it discovers the notation (here EOF, End Of File) which shows termination of data for this activity, file"abcd.exe" can recognize what is divided and recorded on the 2nd cluster, 3rd cluster, 5th cluster, and 8th cluster. A microprocessor 701 controls the secondary memory interface 705, is reading the data of the 2nd, 3rd, 5th, and 8th clusters of a hard disk 706, and obtains the data of file"abcd.exe." The procedure of a top Norikazu ream is also the same as when [also when the contents of the file are data of the usual computer] it is image sound signal data.
[0012]
[Problem(s) to be Solved by the Invention] The conventional record regenerative apparatus is carrying out record playback of the digital broadcasting using the above file systems. However, while this file system was developed for computers and could record the small file of size efficiently, it was not suitable for recording a program with large size like digital broadcasting. Especially, there was a problem that a file system was complicated.
[0013] Moreover, since the file system of a computer became large with the increment in the number of files which the magnitude of a file system records since the record unit (cluster) of a fixed size is adopted regardless of the capacity of a hard disk, it was difficult to store a file system in comparatively small memory apparatus, such as nonvolatile RAM.
[0014] Moreover, although the hard disk generally had a big difference in the data transfer rate by the periphery and inner circumference of a platter, since the data transfer rate had always adopted the record unit (cluster) of a fixed size independently, it had the problem that a big difference will arise, with record in the condition that especially fragmentation advanced, or the data transfer performance at the time of playback.

[0015] This invention offers the record regenerative apparatus equipped with the file system which was suitable for record playback of a program with large size like digital broadcasting. Moreover, the record regenerative apparatus which magnitude of a file system cannot increase easily is offered. The record regenerative apparatus equipped with the file system excellent in the data transfer performance at the time of playback further again is offered.
[0016]
[Means for Solving the Problem] The record regenerative apparatus concerning this invention between the record medium with which it was divided into two or more fields, and the number was matched with a receiving means to receive a digital image sound signal by each field, the 1st address in this divided 1 field, and the 2nd address While matching a record means to record one program which consists of said digital image sound signals, and said number matched with said one program and said one field A storage means to memorize the table which matches said one program and said 2nd address, Based on an operation means to calculate said 1st address based on said number memorized by said storage means, and the 1st address which said operation means calculated and the 2nd address memorized by said table, it has a playback means to reproduce said one program recorded on said record medium.
[0017] Moreover, it sets to the record regenerative apparatus concerning this invention, and said record medium is divided into two or more fields of fixed size.
[0018] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable and it is divided into two or more fields of fixed size to which this record medium does not change with the storage capacity of this record medium.
[0019] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable and it is divided into two or more fields of the fixed number to which this record medium does not change with the storage capacity of this record medium.
[0020] Moreover, it sets to the record regenerative apparatus concerning this invention. Between a receiving means to receive a digital image sound signal, the record medium currently divided into two or more exchangeable fields containing different size, the 1st address in this divided 1 field, and the 2nd address A record means to record one program which consists of said digital image sound signals, Based on said 1st address memorized by a storage means to memorize the table which matches said one program, said 1st address, and said 2nd address, and said storage means, and said 2nd address, it has a playback means to reproduce said one program recorded on said record medium.
[0021] In the record regenerative apparatus concerning this invention, the direction of the field by the side of inner circumference is divided further again so that size may become [said record medium] large rather than the field by the side of the periphery of this record medium.
[0022]
[Embodiment of the Invention] Gestalt 1. drawing 1 of operation shows the gestalt 1 of implementation of this invention, and the input-buffer equipment with which 1 is constituted by input digital image sound signals, such as for example, an MPEG 2 transport stream, and 2 is constituted by FIFO (First In First Out) memory etc. in drawing, the output-buffer equipment with which record media, such as a hard disk, and 5 are constituted by the regenerative apparatus, and 6 is constituted [3] for a recording apparatus and 4 by the FIFO memory etc., and 7 are output digital image sound signals. The CPU bus by which CPU (a central processing unit, Central Processing Unit) and 9 are controlled for 8 from CPU8, the memory apparatus by which 10 is connected on the CPU bus 9, and 11 are file systems stored in the memory apparatus 10. Moreover, the zone where 101 divided the record medium 4, and 102 are programs currently recorded on the record medium 4. As for a zone number index and 113, the zone table on which 111 constitutes a file system 11, and 112 are [a program number train and 114] chain information trains. As for a program number index and 117, the program table on which 115 constitutes a file system 11, and 116 are [an initiation zone number train and 118] program property trains.
[0023] Here explains actuation of the gestalt 1 of operation. It is the signal which received digital satellite broadcasting etc., and the input digital image sound signal 1 is transmitting the program 102 which consists of an image by which compression coding was carried out, and a sound signal according to an MPEG 2 transport stream format. As actuation at the time of program 102 record, after the input digital image sound signal 1 has a constant rate once buffered by input-buffer equipment 2 (are recording), it is burstily recorded on a record medium 4 by the recording apparatus 3. The record medium 4 is beforehand divided into the zone 101 of N individual of fixed size, and one zone 101 is constituted so that the single program 102 may be recorded. The value of N is determined by the size of a record medium 4, and the size of a zone 101. Although it is recorded on two or more zones 101 when a program 102 covers a long time, one zone 101 does not include in coincidence the program (for example, the 1st and the 2nd program 102) from which plurality differs. From the head of the zone 101 which corresponds to the program 102 to reproduce as actuation at the time of program 102 playback, with a regenerative apparatus 5, data are read, and it transmits to an output buffer 6 burstily, and once buffers. An output buffer 6 transmits the output digital image sound signal 7 to latter decoder equipment (not shown), and playback image voice is obtained by making image

voice data decode. It connects with the CPU bus 9, respectively, and input-buffer equipment 2, a recording apparatus 3, a regenerative apparatus 5, and output-buffer equipment 6 are controlled from CPU8.
[0024] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. The record medium 4 is beforehand divided into the field of N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is ******(ed) at worst.
[0025] With the gestalt 1 of operation, the information (file system 11) which associates the program by which the 2nd program 102 is recorded on the 2nd and the 3rd zone 101 (the zone 2 in drawing and zone 3), and the 1st program 102 was recorded as each zone 101 all over the 1st zone 101 (zone 1 in drawing) as shown in drawing shall be stored in a memory apparatus 10.
[0026] A file system 11 consists of a zone table 111 and a program table 115. The zone table 111 consists of a zone number index 112, a program number train 113, and a chain information train 114. The zone number index 112 supports each zone 101 in a record medium 4, and consists of the index of N individual in this example. The program number train 113 shows which program is recorded on each zone 101. The chain information train 114 shows on which zone 101 the program is recorded next by the number of a zone 101 including the record chain information on a program. Next, when there is no zone 101 currently recorded (i.e., when it is the last zone), the notation (here EOF, End Of File) which shows termination of a program is shown.
[0027] Moreover, the program table 115 consists of a program number index 116, an initiation zone number train 117, and a program property train 118. the program number index 116 -- a program 102 -- it is alike, respectively, and it corresponds and consists of the index of M individual in this example. That is, M upper limits are prepared in the number of programs storable in a record medium 4. The value of M does not exceed the value of N at the maximum. The initiation zone number train 117 shows from which zone 101 each program 102 is recorded. The program property train 118 shows the attribute of each program. Operation is arbitrary although the text which shows program title information and the contents of a program can specifically be considered.
[0028] When reproducing a program, CPU8 takes out the information corresponding to the program 102 first reproduced from the program table 115. That is, an initiation zone number is detected from the initiation zone number train 117 of the program number index 116 equivalent to the program 102 to reproduce, a regenerative apparatus 5 is controlled, a program is reproduced from a record medium 4, and it transmits to output-buffer equipment 6.
[0029] If the number of the zone 101 of the head where the 2nd program 102 is recorded from the program table 115 is searched here when reproducing the 2nd program 102 from the condition of drawing 1 , what is recorded from the 2nd zone 101 can be known. CPU8 controls a regenerative apparatus 5 and starts data playback from the 2nd zone 101 of a record medium 4. If data playback of the 2nd zone 101 is completed, CPU8 will search the number of the zone 101 which should be reproduced next from the chain information train 114 of the zone number index 112 equivalent to the 2nd zone 101 in the zone table 111. In this case, it turns out that what is necessary is just to reproduce the 3rd zone 101 next. Termination of playback of the 3rd zone 101 retrieves the chain information on the 3rd zone 101 from the zone table 111 similarly. In this case, since EOF is detected shortly, playback of the 2nd program 102 is completed in the 3rd zone 101.
[0030] When recording a program, CPU8 searches the zone 101 first recordable from the zone table 111. Specifically, the zone number on which the program is not recorded from the program number train 113 of the zone number index 112 can be known. If the recordable zone 101 is found, while filling in the number of the zone 101 recorded on the initiation zone number train 117 of the program number index 116 in the program table 115 next, the number of a program 102 is entered in the program number train 113 in the zone table 111. When record of a program exceeds the size of a zone 101, said procedure is repeated further and the recordable zone 101 is searched. Thus, when a program straddles two or more zones 101, chain information (zone 101 number information which should be reproduced next) is written down in the chain information train 114 in the zone table 111. In ending record of a program, it fills in the notation (here EOF) which shows termination of a program to the chain information train 114 in the zone table 111. In addition, the information which accompanies programs, such as a program title character string, is also recordable on the program property train 118 in the program table 115.
[0031] If the program number train 113 in the zone table 111 is first searched in order when newly recording the 3rd program from the condition of drawing 1 here Since no programs are recorded on the 4th zone 101 of the program number index 112, namely, it turns out that it can record, CPU8 While controlling a recording device 3 and starting record in the 4th zone 101 of a record medium 4, "3" which shows the 3rd program 102 to the program number train 113 of the zone number index 112 corresponding to the 4th zone 101 in the zone table 111 is filled in. When program record is completed in the 4th zone, EOF is entered in the chain information train 114 equivalent to the 4th zone in the zone table 111. When program record is not completed in the 4th zone, the above-mentioned procedure is repeated further, the recordable zone 101 is searched, and record is continued. Moreover, "4" which shows the 4th zone 101 is entered in the initiation zone number train 117 equivalent to the

3rd program of the program number index 116 in the program table 115.
[0032] When eliminating a program, CPU8 detects the number of the initiation zone 101 from the initiation zone number train 117 of the program number index 116 corresponding to the program 102 first eliminated out of the program table 115. Next, the zone 101 which the program 102 which should be eliminated from the program number train 113 and the chain information train 114 of the zone number index 112 corresponding to the initiation zone 101 detected in the zone table 111 occupies is detected altogether. After all the zones 101 are detected, while clearing the program number train 113 and the chain information train 114 of the zone number index 112 to which it corresponds in the zone table 111, elimination of a program can be completed by clearing the initiation zone number train 117 and the program property train 118 in the program table 115.
[0033] When eliminating the 2nd program 102 from the condition of drawing 1 , by searching the initiation zone number train 117 of the program number index 116 corresponding to the 2nd program 102 in the program table 115 shows having started the 2nd program 102 from the 2nd zone 101 here. Next, by searching the chain information train 114 equivalent to the 2nd zone 101 in the zone table 111 shows that the 2nd program 102 follows the 3rd zone 101 further. The chain information train 114 which is equivalent to the 3rd zone 101 in the zone table 111 similarly can be searched, and it can know having completed the 2nd program 102 in the 3rd zone 101 by detecting EOF. These are the same as that of the procedure in the case of reproducing the 2nd program 102. By what (suppose that it is nothing) the program number train 113 and the chain information train 114 of the zone number index 112 corresponding to the 2nd zone 101 and 3rd zone 101 in the zone table 111 are cleared for here, the information about the 2nd program is eliminated from the zone table 111. Moreover, the information about the 2nd program is eliminated from the program table 115 by what (suppose that it is nothing) the initiation zone number train 117 equivalent to the 2nd program 102 in the program table 115 and the program property train 118 are cleared for.
[0034] Although the positional information (address information of a record medium 4) of each zone 101 is needed by this example here when CPU8 performs record or playback of a program 102 to the zone 101 of arbitration, the positional information concerned can be searched for by performing an operation with simple CPU8 from the size of the zone 101 decided beforehand, and the number of a zone 101.
[0035] Moreover, when the size of a zone 101 is set up sufficiently greatly and the last zone 101 of a program 102 is reproduced since a difference arises in the size (or the multiple) of a zone 101, and the size of a program 102, the fault which even invalid data reproduce can be considered. In this case, when the last address of a program 102 is filled in as one of the attributes of the program property train 118 in the program table 115 and it reaches to the last address during playback of the last zone 101, fault can be avoided by ending playback.
[0036] Moreover, although a file system 11 shall be stored in a memory apparatus 10 in this example, it is desirable to shunt a file system 11 to nonvolatile memory in front of power off, using nonvolatile memory so that information can be held also at the time of the power off of a digital-broadcasting receiver. Or you may make it store a file system 11 in a record medium 4.
[0037] The zone number train corresponding to a zone 101 in the program number index corresponding to a program 102 in the program zone table in which gestalt 2. drawing 2 of operation shows the gestalt 2 of implementation of this invention, and the file system according [21] to the gestalt of this operation and 121 show the relation between a program 102 and a zone 101 in drawing, and 122, and 123, and 124 are program property trains, and others are the same as that of the gestalt 1 of operation.
[0038] Here explains actuation of the gestalt 2 of operation. With the gestalt 2 of operation, the information (file system 21) which associates the program by which the 2nd program 102 is recorded on the 2nd and the 3rd zone 101 (the zone 2 in drawing and zone 3), and the 1st program 102 was recorded as each zone 101 all over the 1st zone 101 (zone 1 in drawing) like the gestalt 1 of operation shall be stored in a memory apparatus 10.
[0039] The file system 21 contains the program zone table 121. The program zone table 121 consists of a program number index 122, a zone number train 123, and a program property train 124. The program number index 122 supports each program currently recorded, and consists of M indexes in this example. That is, M upper limits are prepared in the number of programs storable in a record medium 4. The zone number train 123 corresponds to each zone 101 in a record medium 4, and consists of the index of N individual. The value of N is determined by the size of a record medium 4, and the size of a zone 101. The value of M does not exceed the value of N at the maximum. In the program zone table 121, the sequence information in the case of reproducing a program 102 is written down in the zone number train 123 of the program number index 122 corresponding to a certain program 102. The program property train 124 shows the property of each program. Operation is arbitrary although the text which shows program title information and the contents of a program can specifically be considered.
[0040] When reproducing a program, CPU8 searches the zone number train 123 of the program number index 122 corresponding to the program 102 first reproduced out of the program zone table 121. That is, a regenerative apparatus 5 is

controlled from the zone 101 where the program 102 is recorded from the index corresponding to the program 102 to reproduce among the program number indexes 122, and the zone 101 where the order of playback is detected and the program 102 is recorded first, playback is started from a record medium 4, and it transmits to output-buffer equipment 6.
[0041] When reproducing the 2nd program 102 from the condition of drawing 2 and the zone number train 123 of the program number index 122 corresponding to the 2nd program 102 in the program zone table 121 is searched here, it turns out that what is necessary is to reproduce the 2nd zone 101 and just to reproduce the 3rd zone 101 to the 2nd first. CPU8 will continue playback from the 3rd zone 101 continuously, if a regenerative apparatus 5 is controlled, playback is started from the 2nd zone 101 and playback of the 2nd zone 101 is completed. In the place which playback of the 3rd zone 101 completed, playback of the 2nd program 102 is completed now.
[0042] When recording a program, CPU8 searches the zone 101 first recordable from the zone number train 123 in the program zone table 121. If the recordable zone 101 is found, while carrying out the recording start of the data of a program 102 to the zone 101, playback sequence is written down in the zone number train 123 corresponding to the zone 101 which can record the program number index 122 corresponding to the program 102 to record.
[0043] From the condition of drawing 2 , when newly recording the 3rd program, program playback sequence is not indicated among the zone number trains 123 in the 4th zone, namely, since it turns out that it is the recordable zone 101, "1" is entered in the zone number train 123 of the program number index 122 corresponding to the 3rd program as playback sequence here. Next, CPU8 controls a recording apparatus 3 and starts record for the data of the program 102 acquired from input-buffer equipment 2 to the 4th zone 101 in a record medium 4. When record in the 4th zone 101 is completed and it continues record of the 3rd program 102, said procedure is repeated further and the recordable zone 101 is searched. In addition, the information which accompanies programs, such as a program title character string, may be recorded on the program property train 124 of the program zone table 121.
[0044] When eliminating a program, CPU8 searches the program number index 122 corresponding to the program 102 first eliminated in the program zone table 121, and clears all the playback sequence information on the zone number train 123 corresponding to the zone 101 where the program is recorded (suppose that it is nothing).
[0045] When eliminating the 2nd program 102 from the condition of drawing 2 and the zone number train 123 corresponding to the 2nd program 103 in the program zone table 121 is searched here, it turns out that the 2nd program 102 is recorded on the 2nd zone 101 and 3rd zone 101. CPU8 can eliminate the information about the 2nd program 102 by clearing the accompanying information about the 2nd program 102 which cleared all of such filled-in playback sequence, and was written down in the program property train 124. The procedure which detects the zone 101 where the 2nd program 102 is recorded as the elimination approach simplified more may be skipped, and the zone number train 123 and the program property train 124 of the program number index 122 corresponding to the 2nd program 102 may be cleared unconditionally.
[0046] Although the positional information (address information of a record medium 4) of each zone 101 is needed by this example here when CPU8 performs record or playback of a program 102 to the zone 101 of arbitration, it can ask by the simple operation from the size of the zone 101 decided beforehand, and the number of a zone 101.
[0047] Moreover, when the size of a zone 101 is set up sufficiently greatly and the last zone 101 of a program 102 is reproduced since a difference arises in the size (or the multiple) of a zone 101, and the size of a program 102, the fault which even invalid data reproduce can be considered. In this case, when the last address of a program 102 is filled in as one of the attributes of the program property train 124 in the program zone table 121 and it reaches to the last address during playback of the last zone 101, fault can be avoided by ending playback.
[0048] Moreover, although a file system 21 shall be stored in a memory apparatus 10 in this example, it is desirable to shunt a file system 11 to nonvolatile memory in front of power off, using nonvolatile memory so that information can be held also at the time of the power off of a digital-broadcasting receiver. Or you may make it store a file system 21 in a record medium 4.
[0049] Gestalt 3. drawing 3 of operation shows the gestalt 3 of implementation of this invention, and 31 is a file system by the gestalt of this operation in drawing. Moreover, as for a zone number index and 133, the zone table on which the zone where 103 divided the record medium 4, and 131 constitute a file system 31, and 132 are [a program number train and 134] chain information trains, and others are the same as that of the gestalt 1 of operation.
[0050] Here explains actuation of the gestalt 3 of operation. The record medium 4 is beforehand divided into the zone 103 of N individual of the fixed number, and one zone 103 is constituted so that the single program 102 may be recorded. Unlike the gestalt 1 of operation, the value of N is not concerned with the capacity of a record medium 4, but it is always fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 1 of operation.
[0051] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. A record medium 4 is beforehand divided into the field of fixed size, and even when record and elimination are repeated by using as a record unit of

a program 102, the data continuity for one field is secured at worst.
[0052] In this example, when CPU8 performs record or playback of a program 102 to the zone 103 of arbitration, the positional information (address information of a record medium 4) of each zone 103 is needed, but when it chooses so that the size of each zone 103 may become equal, it can ask by the simple operation from the number N of the zone 103 beforehand decided to be the capacity of a record medium 4.
[0053] With the gestalt 3 of operation, in order that the value of N may not be dependent on the capacity of a record medium 4, the line count of the zone number index 132 in the zone table 131 and the number of trains of the program number train 133 and the chain information train 134 become fixed. Thus, by making the number of zones 103 regularity, the table size of a file system 31 is not concerned with the capacity of a record medium 4, but becomes always fixed. For example, since it is necessary to hold information also at the time of the power off of a digital-broadcasting receiver, it is necessary to record a file system 31 on nonvolatile memory etc. but, and even when a record medium 4 is exchanged and capacity increases, since the size of a file system 31 does not increase, it does not need to extend memory space.
[0054] Gestalt 4. drawing 4 of operation shows the gestalt 4 of implementation of this invention, and sets it to drawing. 41 The file system by the gestalt of this operation and 103 The program zone table in which the zone which divided the record medium 4, and 141 show the relation between a program 102 and a zone 103, and 142 The zone number train corresponding to a zone 103 in the program number index corresponding to a program 102 and 143 and 144 are program property trains, and others are the same as that of the gestalt 2 of operation.
[0055] Here explains actuation of the gestalt 4 of operation. The record medium 4 is beforehand divided into the zone 103 of N individual of the fixed number, and one zone 103 is constituted so that the single program 102 may be recorded. Unlike the gestalt 2 of operation, the value of N is not concerned with the capacity of a record medium 4, but it is always fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 2 of operation.
[0056] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. A record medium 4 is beforehand divided into the field of a fixed number N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is secured at worst.
[0057] In this example, when CPU8 performs record or playback of a program 102 to the zone 103 of arbitration, the positional information (address information of a record medium 4) of each zone 103 is needed, but when it chooses so that the size of each zone 103 may become equal, it can ask by the simple operation from the number N of the zone 101 beforehand decided to be the capacity of a record medium 4.
[0058] With the gestalt 4 of operation, in order that the value of N may not be dependent on the capacity of a record medium 4, the number of trains of the zone number train 142 in the program zone table 141 becomes fixed. Thus, by making the number of zones 103 regularity, the table size of a file system 41 is not concerned with the capacity of a record medium 4, but becomes always fixed. For example, since it is necessary to hold information also at the time of the power off of a digital-broadcasting receiver, it is necessary to record a file system 41 on nonvolatile memory etc. but, and even when a record medium 4 is exchanged and capacity increases, since the size of a file system 41 does not increase, it does not need to extend memory space.
[0059] Gestalt 5. drawing 5 of operation shows the gestalt 5 of implementation of this invention, and 51 is a file system by the gestalt of this operation in drawing. Moreover, for the zone table on which the zone where 104 divided the record medium 4, and 151 constitute a file system 51, and 152, as for a program number train and 154, a zone number index and 153 are [a chain information train and 155] zone property trains, and others are the same as that of the gestalt 1 of operation.
[0060] Here explains actuation of the gestalt 5 of operation. The record medium 4 is beforehand divided into the zone 104 of N individual, and one zone 104 is constituted so that the single program 102 may be recorded. Unlike the gestalt 1 of operation, the size of each zone 104 is not fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 1 of operation.
[0061] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. A record medium 4 is beforehand divided into the field of N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is secured at worst.
[0062] Therefore, the data transfer performance of record or playback is secured, namely, in order to secure a data continuity, the larger one is advantageous [area size]. However, when the data of a program 102 do not fulfill one field (zone 104) with one side, in order that the surplus in a field may serve as an invalid-data field which is not used and may reduce the utilization ratio of a record medium 4 as a result, from the field of recording efficiency, the smaller one is desirable [a surplus / zone 104 size].

[0063] For example, in the case of a hard disk etc., on the periphery of a platter, it has a high data transfer rate, but in inner circumference, it is that a data transfer rate falls in most cases. The data transfer rate means the data transfer rate between the platter except overheads, such as head transit time, and a head here. Therefore, a lower part needs to secure the continuity of data more and the data transfer rate of a record medium 4 needs to lessen an overhead for it. With the gestalt of this operation, the data transfer rate is divided by the lower part so that the size of a zone 104 may become large. That is, the size of each zone 104 is selected by the size which was in inverse proportion to the data transfer rate in general. Thus, according to the data transfer rate of a record medium 4, the data transfer performance and recording efficiency of record or playback can be reconciled by choosing the size of each zone 104 the optimal.
[0064] In this example, when CPU8 performs record or playback of a program 102 to the zone 104 of arbitration, unlike the gestalt 1 of operation, it becomes difficult to search for the positional information (address information of a record medium 4) of each zone 104 by the simple operation. In that case, before indicating a starting address, an ending address, etc. of each zone 104 as an attribute in the zone property train 155 of the zone number index 152 corresponding to each zone 104 in the zone table 151 and performing record or playback to the zone 104 of arbitration, address information can be obtained by referring to the zone property train 155.
[0065] Gestalt 6. drawing 6 of operation shows the gestalt 6 of implementation of this invention, and sets it to drawing. 61 The file system by the gestalt of this operation and 163 The program zone table in which the zone which divided the record medium 4, and 161 showed the relation between a program 102 and a zone 104, and 162 The zone number train corresponding to a zone 104 in the program number index corresponding to a program 102 and 163 and 164 are program property trains, 165 is a zone property train, and others are the same as that of the gestalt 2 of operation.
[0066] Here explains actuation of the gestalt 6 of operation. The record medium 4 is beforehand divided into the zone 104 of N individual, and one zone 104 is constituted so that the single program 102 may be recorded. Unlike the gestalt 2 of operation, the size of each zone 104 is not fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 2 of operation.
[0067] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. The record medium 4 is beforehand divided into the field of N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is secured at worst.
[0068] Therefore, the data transfer performance of record or playback is secured, namely, in order to secure a data continuity, the larger one is advantageous [area size]. However, when the data of a program 102 do not fulfill one field (zone 104) with one side, in order that the surplus in a field may serve as an invalid-data field which is not used and may reduce the utilization ratio of a record medium 4 as a result, from the field of recording efficiency, the smaller one is desirable [a surplus / area size].
[0069] For example, in the case of a hard disk etc., on the periphery of a platter, it has a high data transfer rate, but in inner circumference, it is that a data transfer rate falls in most cases. The data transfer rate means the data transfer rate between the platter except overheads, such as head transit time, and a head here. Therefore, a lower part needs to secure the continuity of data more and the data transfer rate of a record medium 4 needs to lessen an overhead for it. With the gestalt of this operation, the data transfer rate is divided by the lower part so that the size of a zone 104 may become large. That is, the size of each zone 104 is selected by the size which was in inverse proportion to the data transfer rate in general. Thus, according to the data transfer rate of a record medium 4, the data transfer performance and recording efficiency of record or playback can be reconciled by choosing the size of each zone 104 the optimal.
[0070] In this example, when CPU8 performs record or playback of a program 102 to the zone 104 of arbitration, unlike the gestalt 2 of operation, it becomes difficult to search for the positional information (address information of a record medium 4) of each zone 104 by the simple operation. In that case, before indicating a starting address, an ending address, etc. of each zone as an attribute in the zone property train 165 of the zone number train 163 corresponding to each zone 104 in the program zone table 161 and performing record or playback to the zone 104 of arbitration, address information can be obtained by referring to the zone property train 165.
[0071]
[Effect of the Invention] Since this invention is constituted as explained above, effectiveness as taken below is done so. A receiving means to receive a digital image sound signal in the record regenerative apparatus concerning this invention, Between the record medium with which it was divided into two or more fields, and the number was matched with each field, the 1st address in this divided 1 field, and the 2nd address While matching a record means to record one program which consists of said digital image sound signals, and said number matched with said one program and said one field A storage means to memorize the table which matches said one program and said 2nd address, An operation means to calculate said 1st address based on said number memorized by said storage means, Since it had a playback means to reproduce said one

program recorded on said record medium, based on the 1st address which said operation means calculated, and the 2nd address memorized by said table Even if it is the case where one field is made so large that a group enters most, a record regenerative apparatus with easy field management can be obtained.
[0072] Moreover, since it sets to the record regenerative apparatus concerning this invention and said record medium is divided into two or more fields of fixed size, management of the field concerned is easy and the operation of said 1st address can obtain an easy record regenerative apparatus.
[0073] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable, and since this record medium is divided into two or more fields of the fixed size which does not change with the storage capacity of this record medium, said 1st address can be calculated, without changing the operation approach in said operation means, even if it is the case where record media are exchanged.
[0074] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable, since this record medium is divided into two or more fields of the fixed number which does not change with the storage capacity of this record medium, it cannot be concerned with the storage capacity of said record medium, but size of said table can be made regularity.
[0075] Moreover, it sets to the record regenerative apparatus concerning this invention. Between a receiving means to receive a digital image sound signal, the record medium currently divided into two or more exchangeable fields containing different size, the 1st address in this divided 1 field, and the 2nd address A record means to record one program which consists of said digital image sound signals, A storage means to memorize the table which matches said one program, said 1st address, and said 2nd address, Since it had a playback means to reproduce said one program recorded on said record medium, based on said 1st address memorized by said storage means and said 2nd address, the record regenerative apparatus excellent in data transfer performance can be obtained.
[0076] In the record regenerative apparatus concerning this invention, said record medium can obtain the record regenerative apparatus with which size was excellent in data transfer performance since the direction of the field by the side of inner circumference was divided so that it might become large further again rather than the field by the side of the periphery of this record medium.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the record regenerative apparatus which receives digital broadcasting, or receives analog broadcasting, changes into a digital image sound signal, and is recorded on a record medium.

PRIOR ART

[Description of the Prior Art] There is a record regenerative apparatus shown in JP,11-39850,A as conventional equipment which can carry out record playback of the MPEG (Moving Pictures Experts Group) stream which is a typical digital image sound signal. Drawing 7 is the example of a configuration of the record regenerative apparatus based on the computer shown in this JP,11-39850,A. In drawing 701 main memory and 703 for a microprocessor and 702 A bus bridge, An I/O (Input/Output) interface and 705 704 A secondary memory interface, It is the memory (VRAM) which said AV processing circuit 708 uses the hard disk by which 706 was connected to said secondary memory interface, the MPEG real-time encoder board on which 707 built in TV tuner, and 708 for AV processing circuit, and uses 709 for image display processing.
[0003] A microprocessor 701, main memory 702, and a bus bridge 703 are mutually connected through the internal bus, and the remaining block is mutually connected through the expansion bus. The bus bridge 703 is controlling the exchange of the data between an internal bus and expansion buses, such as for example, a PCI (Peripheral Component Interconnect) bus and an ISA (Industry Standard Architecture) bus.
[0004] The secondary memory interface 705, the MPEG real-time encoder board 707, and AV processing circuit 708 are connected to an expansion bus, and the hard disk 706 is connected to said secondary memory interface 705.
[0005] A microprocessor 701 is performing various kinds of application programs recorded on this hard disk 706 under the control of an operating system recorded on the hard disk 706, for example, performs record of an image, playback, edit, decoding, and other predetermined processings.

[0006] The MPEG real-time encoder board 707 is real time, for example, encodes an image and voice based on the specification of MPEG1, contains TV tuner which receives a television broadcasting program, and can carry out MPEG encoding of the program which this TV tuner received.
[0007] AV processing circuit 708 consists of VGA (Video Graphics Array), a three-dimension accelerator (neither is illustrated), etc., and performs the voice output to the graphic display and the loudspeaker to a display. Moreover, AV processing circuit 708 can output the image which contained the NTSC encoder, for example, was based on NTSC system at VTR etc.
[0008] Processing of record of the image of an image, playback, edit, decoding, etc. is made by the application program currently recorded on the hard disk 706. For example, the television broadcasting program received with TV tuner of the MPEG real-time encoder board 707 is encoded to an MPEG stream, and the data is recorded on a hard disk 706 through an expansion bus. Furthermore, it is made as [perform / during the record / playback of the scene of the arbitration of an image / finishing / an image transcription / already / (image) etc.].
[0009] The drawing 7 lower part shows the file system called FAT (File Allocation Table) currently generally used by computer. 710 is a file table and 711 is a cluster table. In 712, an extension train and 714 are the 1st cluster trains, and a file name index and 713 constitute the file table 710 by these. 715 is an entry number index and 716 is FAT. ID train and 717 are cluster number trains, and constitute the cluster table 710 by these.
[0010] The hard disk has the smallest unit of data logging called a sector, for example, in the case of the hard disk of an IDE (Integrated Drive Electronics) method, sector size is 512B (cutting tool). By computer, when recording data on a hard disk, it is common to divide and record [to which a sector is called the collection ** cluster of exponentiation individuals of 2] data for every unit, and the sizes of a cluster are 32kB immobilization and 4kB immobilization in many cases. For example, when the file named abcd.exe is divided into four clusters (the 2nd cluster, 3rd cluster, 5th cluster, and 8th cluster) and is recorded on the hard disk, first, file name "abcd" is stored in the file name index 712 of the file table 710, and "exe" is stored in the extension train 713, respectively. Moreover, the head cluster number (2 which shows the 2nd cluster here) of the cluster currently divided and recorded is stored in the 1st cluster train 714.
[0011] In actually reading the data of file"abcd.exe", it searches the entry to which the 2nd is equivalent cluster 2 out of the entry number index 715 of the cluster table 711. Moreover, FAT of the 2nd entry The following entry number (3 which shows the 3rd cluster here) is stored in the ID train 716. By repeating until it discovers the notation (here EOF, End Of File) which shows termination of data for this activity, file"abcd.exe" can recognize what is divided and recorded on the 2nd cluster, 3rd cluster, 5th cluster, and 8th cluster. A microprocessor 701 controls the secondary memory interface 705, is reading the data of the 2nd, 3rd, 5th, and 8th clusters of a hard disk 706, and obtains the data of file"abcd.exe." The procedure of a top Norikazu ream is also the same as when [also when the contents of the file are data of the usual computer] it is image sound signal data.

EFFECT OF THE INVENTION

[Effect of the Invention] Since this invention is constituted as explained above, effectiveness as taken below is done so. A receiving means to receive a digital image sound signal in the record regenerative apparatus concerning this invention, Between the record medium with which it was divided into two or more fields, and the number was matched with each field, the 1st address in this divided 1 field, and the 2nd address While matching a record means to record one program which consists of said digital image sound signals, and said number matched with said one program and said one field A storage means to memorize the table which matches said one program and said 2nd address, An operation means to calculate said 1st address based on said number memorized by said storage means, Since it had a playback means to reproduce said one program recorded on said record medium, based on the 1st address which said operation means calculated, and the 2nd address memorized by said table Even if it is the case where one field is made so large that a group enters most, a record regenerative apparatus with easy field management can be obtained.
[0072] Moreover, since it sets to the record regenerative apparatus concerning this invention and said record medium is divided into two or more fields of fixed size, management of the field concerned is easy and the operation of said 1st address can obtain an easy record regenerative apparatus.
[0073] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable, and since this record medium is divided into two or more fields of the fixed size which does not change with the storage capacity of this record medium, said 1st address can be calculated, without changing the operation approach in said operation means, even if it is the case where record media are exchanged.
[0074] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable, since

this record medium is divided into two or more fields of the fixed number which does not change with the storage capacity of this record medium, it cannot be concerned with the storage capacity of said record medium, but size of said table can be made regularity.
[0075] Moreover, it sets to the record regenerative apparatus concerning this invention. Between a receiving means to receive a digital image sound signal, the record medium currently divided into two or more exchangeable fields containing different size, the 1st address in this divided 1 field, and the 2nd address A record means to record one program which consists of said digital image sound signals, A storage means to memorize the table which matches said one program, said 1st address, and said 2nd address, Since it had a playback means to reproduce said one program recorded on said record medium, based on said 1st address memorized by said storage means and said 2nd address, the record regenerative apparatus excellent in data transfer performance can be obtained.
[0076] In the record regenerative apparatus concerning this invention, said record medium can obtain the record regenerative apparatus with which size was excellent in data transfer performance since the direction of the field by the side of inner circumference was divided so that it might become large further again rather than the field by the side of the periphery of this record medium.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The conventional record regenerative apparatus is carrying out record playback of the digital broadcasting using the above file systems. However, while this file system was developed for computers and could record the small file of size efficiently, it was not suitable for recording a program with large size like digital broadcasting. Especially, there was a problem that a file system was complicated.
[0013] Moreover, since the file system of a computer became large with the increment in the number of files which the magnitude of a file system records since the record unit (cluster) of a fixed size is adopted regardless of the capacity of a hard disk, it was difficult to store a file system in comparatively small memory apparatus, such as nonvolatile RAM.
[0014] Moreover, although the hard disk generally had a big difference in the data transfer rate by the periphery and inner circumference of a platter, since the data transfer rate had always adopted the record unit (cluster) of a fixed size independently, it had the problem that a big difference will arise, with record in the condition that especially fragmentation advanced, or the data transfer performance at the time of playback.
[0015] This invention offers the record regenerative apparatus equipped with the file system which was suitable for record playback of a program with large size like digital broadcasting. Moreover, the record regenerative apparatus which magnitude of a file system cannot increase easily is offered. The record regenerative apparatus equipped with the file system excellent in the data transfer performance at the time of playback further again is offered.

MEANS

[Means for Solving the Problem] The record regenerative apparatus concerning this invention between the record medium with which it was divided into two or more fields, and the number was matched with a receiving means to receive a digital image sound signal by each field, the 1st address in this divided 1 field, and the 2nd address While matching a record means to record one program which consists of said digital image sound signals, and said number matched with said one program and said one field A storage means to memorize the table which matches said one program and said 2nd address, Based on an operation means to calculate said 1st address based on said number memorized by said storage means, and the 1st address which said operation means calculated and the 2nd address memorized by said table, it has a playback means to reproduce said one program recorded on said record medium.
[0017] Moreover, it sets to the record regenerative apparatus concerning this invention, and said record medium is divided into two or more fields of fixed size.
[0018] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable and it is divided into two or more fields of fixed size to which this record medium does not change with the storage capacity of this record medium.
[0019] Moreover, in the record regenerative apparatus concerning this invention, said record medium is exchangeable and it is

divided into two or more fields of the fixed number to which this record medium does not change with the storage capacity of this record medium.
[0020] Moreover, it sets to the record regenerative apparatus concerning this invention. Between a receiving means to receive a digital image sound signal, the record medium currently divided into two or more exchangeable fields containing different size, the 1st address in this divided 1 field, and the 2nd address A record means to record one program which consists of said digital image sound signals, Based on said 1st address memorized by a storage means to memorize the table which matches said one program, said 1st address, and said 2nd address, and said storage means, and said 2nd address, it has a playback means to reproduce said one program recorded on said record medium.
[0021] In the record regenerative apparatus concerning this invention, the direction of the field by the side of inner circumference is divided further again so that size may become [said record medium] large rather than the field by the side of the periphery of this record medium.
[0022]
[Embodiment of the Invention] Gestalt 1. drawing 1 of operation shows the gestalt 1 of implementation of this invention, and the input-buffer equipment with which 1 is constituted by input digital image sound signals, such as for example, an MPEG 2 transport stream, and 2 is constituted by FIFO (First In First Out) memory etc. in drawing, the output-buffer equipment with which record media, such as a hard disk, and 5 are constituted by the regenerative apparatus, and 6 is constituted [3] for a recording apparatus and 4 by the FIFO memory etc., and 7 are output digital image sound signals. The CPU bus by which CPU (a central processing unit, Central Processing Unit) and 9 are controlled for 8 from CPU8, the memory apparatus by which 10 is connected on the CPU bus 9, and 11 are file systems stored in the memory apparatus 10. Moreover, the zone where 101 divided the record medium 4, and 102 are programs currently recorded on the record medium 4. As for a zone number index and 113, the zone table on which 111 constitutes a file system 11, and 112 are [a program number train and 114] chain information trains. As for a program number index and 117, the program table on which 115 constitutes a file system 11, and 116 are [an initiation zone number train and 118] program property trains.
[0023] Here explains actuation of the gestalt 1 of operation. It is the signal which received digital satellite broadcasting etc., and the input digital image sound signal 1 is transmitting the program 102 which consists of an image by which compression coding was carried out, and a sound signal according to an MPEG 2 transport stream format. As actuation at the time of program 102 record, after the input digital image sound signal 1 has a constant rate once buffered by input-buffer equipment 2 (are recording), it is burstily recorded on a record medium 4 by the recording apparatus 3. The record medium 4 is beforehand divided into the zone 101 of N individual of fixed size, and one zone 101 is constituted so that the single program 102 may be recorded. The value of N is determined by the size of a record medium 4, and the size of a zone 101. Although it is recorded on two or more zones 101 when a program 102 covers a long time, one zone 101 does not include in coincidence the program (for example, the 1st and the 2nd program 102) from which plurality differs. From the head of the zone 101 which corresponds to the program 102 to reproduce as actuation at the time of program 102 playback, with a regenerative apparatus 5, data are read, and it transmits to an output buffer 6 burstily, and once buffers. An output buffer 6 transmits the output digital image sound signal 7 to latter decoder equipment (not shown), and playback image voice is obtained by making image voice data decode. It connects with the CPU bus 9, respectively, and input-buffer equipment 2, a recording apparatus 3, a regenerative apparatus 5, and output-buffer equipment 6 are controlled from CPU8.
[0024] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. The record medium 4 is beforehand divided into the field of N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is ******(ed) at worst.
[0025] With the gestalt 1 of operation, the information (file system 11) which associates the program by which the 2nd program 102 is recorded on the 2nd and the 3rd zone 101 (the zone 2 in drawing and zone 3), and the 1st program 102 was recorded as each zone 101 all over the 1st zone 101 (zone 1 in drawing) as shown in drawing shall be stored in a memory apparatus 10.
[0026] A file system 11 consists of a zone table 111 and a program table 115. The zone table 111 consists of a zone number index 112, a program number train 113, and a chain information train 114. The zone number index 112 supports each zone 101 in a record medium 4, and consists of the index of N individual in this example. The program number train 113 shows which program is recorded on each zone 101. The chain information train 114 shows on which zone 101 the program is recorded next by the number of a zone 101 including the record chain information on a program. Next, when there is no zone 101 currently recorded (i.e., when it is the last zone), the notation (here EOF, End Of File) which shows termination of a program is shown.
[0027] Moreover, the program table 115 consists of a program number index 116, an initiation zone number train 117, and a program property train 118. the program number index 116 -- a program 102 -- it is alike, respectively, and it corresponds and

consists of the index of M individual in this example. That is, M upper limits are prepared in the number of programs storable in a record medium 4. The value of M does not exceed the value of N at the maximum. The initiation zone number train 117 shows from which zone 101 each program 102 is recorded. The program property train 118 shows the attribute of each program. Operation is arbitrary although the text which shows program title information and the contents of a program can specifically be considered.

[0028] When reproducing a program, CPU8 takes out the information corresponding to the program 102 first reproduced from the program table 115. That is, an initiation zone number is detected from the initiation zone number train 117 of the program number index 116 equivalent to the program 102 to reproduce, a regenerative apparatus 5 is controlled, a program is reproduced from a record medium 4, and it transmits to output-buffer equipment 6.

[0029] If the number of the zone 101 of the head where the 2nd program 102 is recorded from the program table 115 is searched here when reproducing the 2nd program 102 from the condition of drawing 1 , what is recorded from the 2nd zone 101 can be known. CPU8 controls a regenerative apparatus 5 and starts data playback from the 2nd zone 101 of a record medium 4. If data playback of the 2nd zone 101 is completed, CPU8 will search the number of the zone 101 which should be reproduced next from the chain information train 114 of the zone number index 112 equivalent to the 2nd zone 101 in the zone table 111. In this case, it turns out that what is necessary is just to reproduce the 3rd zone 101 next. Termination of playback of the 3rd zone 101 retrieves the chain information on the 3rd zone 101 from the zone table 111 similarly. In this case, since EOF is detected shortly, playback of the 2nd program 102 is completed in the 3rd zone 101.

[0030] When recording a program, CPU8 searches the zone 101 first recordable from the zone table 111. Specifically, the zone number on which the program is not recorded from the program number train 113 of the zone number index 112 can be known. If the recordable zone 101 is found, while filling in the number of the zone 101 recorded on the initiation zone number train 117 of the program number index 116 in the program table 115 next, the number of a program 102 is entered in the program number train 113 in the zone table 111. When record of a program exceeds the size of a zone 101, said procedure is repeated further and the recordable zone 101 is searched. Thus, when a program straddles two or more zones 101, chain information (zone 101 number information which should be reproduced next) is written down in the chain information train 114 in the zone table 111. In ending record of a program, it fills in the notation (here EOF) which shows termination of a program to the chain information train 114 in the zone table 111. In addition, the information which accompanies programs, such as a program title character string, is also recordable on the program property train 118 in the program table 115.

[0031] If the program number train 113 in the zone table 111 is first searched in order when newly recording the 3rd program from the condition of drawing 1 here Since no programs are recorded on the 4th zone 101 of the program number index 112, namely, it turns out that it can record, CPU8 While controlling a recording device 3 and starting record in the 4th zone 101 of a record medium 4, "3" which shows the 3rd program 102 to the program number train 113 of the zone number index 112 corresponding to the 4th zone 101 in the zone table 111 is filled in. When program record is completed in the 4th zone, EOF is entered in the chain information train 114 equivalent to the 4th zone in the zone table 111. When program record is not completed in the 4th zone, the above-mentioned procedure is repeated further, the recordable zone 101 is searched, and record is continued. Moreover, "4" which shows the 4th zone 101 is entered in the initiation zone number train 117 equivalent to the 3rd program of the program number index 116 in the program table 115.

[0032] When eliminating a program, CPU8 detects the number of the initiation zone 101 from the initiation zone number train 117 of the program number index 116 corresponding to the program 102 first eliminated out of the program table 115. Next, the zone 101 which the program 102 which should be eliminated from the program number train 113 and the chain information train 114 of the zone number index 112 corresponding to the initiation zone 101 detected in the zone table 111 occupies is detected altogether. After all the zones 101 are detected, while clearing the program number train 113 and the chain information train 114 of the zone number index 112 to which it corresponds in the zone table 111, elimination of a program can be completed by clearing the initiation zone number train 117 and the program property train 118 in the program table 115.

[0033] When eliminating the 2nd program 102 from the condition of drawing 1 , by searching the initiation zone number train 117 of the program number index 116 corresponding to the 2nd program 102 in the program table 115 shows having started the 2nd program 102 from the 2nd zone 101 here. Next, by searching the chain information train 114 equivalent to the 2nd zone 101 in the zone table 111 shows that the 2nd program 102 follows the 3rd zone 101 further. The chain information train 114 which is equivalent to the 3rd zone 101 in the zone table 111 similarly can be searched, and it can know having completed the 2nd program 102 in the 3rd zone 101 by detecting EOF. These are the same as that of the procedure in the case of reproducing the 2nd program 102. By what (suppose that it is nothing) the program number train 113 and the chain information train 114 of the zone number index 112 corresponding to the 2nd zone 101 and 3rd zone 101 in the zone table 111 are cleared for here, the information about the 2nd program is eliminated from the zone table 111. Moreover, the information about the 2nd program is eliminated from the program table 115 by what (suppose that it is nothing) the initiation

zone number train 117 equivalent to the 2nd program 102 in the program table 115 and the program property train 118 are cleared for.
[0034] Although the positional information (address information of a record medium 4) of each zone 101 is needed by this example here when CPU8 performs record or playback of a program 102 to the zone 101 of arbitration, the positional information concerned can be searched for by performing an operation with simple CPU8 from the size of the zone 101 decided beforehand, and the number of a zone 101.
[0035] Moreover, when the size of a zone 101 is set up sufficiently greatly and the last zone 101 of a program 102 is reproduced since a difference arises in the size (or the multiple) of a zone 101, and the size of a program 102, the fault which even invalid data reproduce can be considered. In this case, when the last address of a program 102 is filled in as one of the attributes of the program property train 118 in the program table 115 and it reaches to the last address during playback of the last zone 101, fault can be avoided by ending playback.
[0036] Moreover, although a file system 11 shall be stored in a memory apparatus 10 in this example, it is desirable to shunt a file system 11 to nonvolatile memory in front of power off, using nonvolatile memory so that information can be held also at the time of the power off of a digital-broadcasting receiver. Or you may make it store a file system 11 in a record medium 4.
[0037] The zone number train corresponding to a zone 101 in the program number index corresponding to a program 102 in the program zone table in which gestalt 2. drawing 2 of operation shows the gestalt 2 of implementation of this invention, and the file system according [21] to the gestalt of this operation and 121 show the relation between a program 102 and a zone 101 in drawing, and 122, and 123, and 124 are program property trains, and others are the same as that of the gestalt 1 of operation.
[0038] Here explains actuation of the gestalt 2 of operation. With the gestalt 2 of operation, the information (file system 21) which associates the program by which the 2nd program 102 is recorded on the 2nd and the 3rd zone 101 (the zone 2 in drawing and zone 3), and the 1st program 102 was recorded as each zone 101 all over the 1st zone 101 (zone 1 in drawing) like the gestalt 1 of operation shall be stored in a memory apparatus 10.
[0039] The file system 21 contains the program zone table 121. The program zone table 121 consists of a program number index 122, a zone number train 123, and a program property train 124. The program number index 122 supports each program currently recorded, and consists of M indexes in this example. That is, M upper limits are prepared in the number of programs storable in a record medium 4. The zone number train 123 corresponds to each zone 101 in a record medium 4, and consists of the index of N individual. The value of N is determined by the size of a record medium 4, and the size of a zone 101. The value of M does not exceed the value of N at the maximum. In the program zone table 121, the sequence information in the case of reproducing a program 102 is written down in the zone number train 123 of the program number index 122 corresponding to a certain program 102. The program property train 124 shows the property of each program. Operation is arbitrary although the text which shows program title information and the contents of a program can specifically be considered.
[0040] When reproducing a program, CPU8 searches the zone number train 123 of the program number index 122 corresponding to the program 102 first reproduced out of the program zone table 121. That is, a regenerative apparatus 5 is controlled from the zone 101 where the program 102 is recorded from the index corresponding to the program 102 to reproduce among the program number indexes 122, and the zone 101 where the order of playback is detected and the program 102 is recorded first, playback is started from a record medium 4, and it transmits to output-buffer equipment 6.
[0041] When reproducing the 2nd program 102 from the condition of drawing 2 and the zone number train 123 of the program number index 122 corresponding to the 2nd program 102 in the program zone table 121 is searched here, it turns out that what is necessary is to reproduce the 2nd zone 101 and just to reproduce the 3rd zone 101 to the 2nd first. CPU8 will continue playback from the 3rd zone 101 continuously, if a regenerative apparatus 5 is controlled, playback is started from the 2nd zone 101 and playback of the 2nd zone 101 is completed. In the place which playback of the 3rd zone 101 completed, playback of the 2nd program 102 is completed now.
[0042] When recording a program, CPU8 searches the zone 101 first recordable from the zone number train 123 in the program zone table 121. If the recordable zone 101 is found, while carrying out the recording start of the data of a program 102 to the zone 101, playback sequence is written down in the zone number train 123 corresponding to the zone 101 which can record the program number index 122 corresponding to the program 102 to record.
[0043] From the condition of drawing 2 , when newly recording the 3rd program, program playback sequence is not indicated among the zone number trains 123 in the 4th zone, namely, since it turns out that it is the recordable zone 101, "1" is entered in the zone number train 123 of the program number index 122 corresponding to the 3rd program as playback sequence here. Next, CPU8 controls a recording apparatus 3 and starts record for the data of the program 102 acquired from input-buffer equipment 2 to the 4th zone 101 in a record medium 4. When record in the 4th zone 101 is completed and it continues record of the 3rd program 102, said procedure is repeated further and the recordable zone 101 is searched. In addition, the

information which accompanies programs, such as a program title character string, may be recorded on the program property train 124 of the program zone table 121.
[0044] When eliminating a program, CPU8 searches the program number index 122 corresponding to the program 102 first eliminated in the program zone table 121, and clears all the playback sequence information on the zone number train 123 corresponding to the zone 101 where the program is recorded (suppose that it is nothing).
[0045] When eliminating the 2nd program 102 from the condition of drawing 2 and the zone number train 123 corresponding to the 2nd program 103 in the program zone table 121 is searched here, it turns out that the 2nd program 102 is recorded on the 2nd zone 101 and 3rd zone 101. CPU8 can eliminate the information about the 2nd program 102 by clearing the accompanying information about the 2nd program 102 which cleared all of such filled-in playback sequence, and was written down in the program property train 124. The procedure which detects the zone 101 where the 2nd program 102 is recorded as the elimination approach simplified more may be skipped, and the zone number train 123 and the program property train 124 of the program number index 122 corresponding to the 2nd program 102 may be cleared unconditionally.
[0046] Although the positional information (address information of a record medium 4) of each zone 101 is needed by this example here when CPU8 performs record or playback of a program 102 to the zone 101 of arbitration, it can ask by the simple operation from the size of the zone 101 decided beforehand, and the number of a zone 101.
[0047] Moreover, when the size of a zone 101 is set up sufficiently greatly and the last zone 101 of a program 102 is reproduced since a difference arises in the size (or the multiple) of a zone 101, and the size of a program 102, the fault which even invalid data reproduce can be considered. In this case, when the last address of a program 102 is filled in as one of the attributes of the program property train 124 in the program zone table 121 and it reaches to the last address during playback of the last zone 101, fault can be avoided by ending playback.
[0048] Moreover, although a file system 21 shall be stored in a memory apparatus 10 in this example, it is desirable to shunt a file system 11 to nonvolatile memory in front of power off, using nonvolatile memory so that information can be held also at the time of the power off of a digital-broadcasting receiver. Or you may make it store a file system 21 in a record medium 4.
[0049] Gestalt 3. drawing 3 of operation shows the gestalt 3 of implementation of this invention, and 31 is a file system by the gestalt of this operation in drawing. Moreover, as for a zone number index and 133, the zone table on which the zone where 103 divided the record medium 4, and 131 constitute a file system 31, and 132 are [a program number train and 134] chain information trains, and others are the same as that of the gestalt 1 of operation.
[0050] Here explains actuation of the gestalt 3 of operation. The record medium 4 is beforehand divided into the zone 103 of N individual of the fixed number, and one zone 103 is constituted so that the single program 102 may be recorded. Unlike the gestalt 1 of operation, the value of N is not concerned with the capacity of a record medium 4, but it is always fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 1 of operation.
[0051] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. A record medium 4 is beforehand divided into the field of fixed size, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is secured at worst.
[0052] In this example, when CPU8 performs record or playback of a program 102 to the zone 103 of arbitration, the positional information (address information of a record medium 4) of each zone 103 is needed, but when it chooses so that the size of each zone 103 may become equal, it can ask by the simple operation from the number N of the zone 103 beforehand decided to be the capacity of a record medium 4.
[0053] With the gestalt 3 of operation, in order that the value of N may not be dependent on the capacity of a record medium 4, the line count of the zone number index 132 in the zone table 131 and the number of trains of the program number train 133 and the chain information train 134 become fixed. Thus, by making the number of zones 103 regularity, the table size of a file system 31 is not concerned with the capacity of a record medium 4, but becomes always fixed. For example, since it is necessary to hold information also at the time of the power off of a digital-broadcasting receiver, it is necessary to record a file system 31 on nonvolatile memory etc. but, and even when a record medium 4 is exchanged and capacity increases, since the size of a file system 31 does not increase, it does not need to extend memory space.
[0054] Gestalt 4. drawing 4 of operation shows the gestalt 4 of implementation of this invention, and sets it to drawing. 41 The file system by the gestalt of this operation and 103 The program zone table in which the zone which divided the record medium 4, and 141 show the relation between a program 102 and a zone 103, and 142 The zone number train corresponding to a zone 103 in the program number index corresponding to a program 102 and 143 and 144 are program property trains, and others are the same as that of the gestalt 2 of operation.
[0055] Here explains actuation of the gestalt 4 of operation. The record medium 4 is beforehand divided into the zone 103 of N individual of the fixed number, and one zone 103 is constituted so that the single program 102 may be recorded. Unlike the

gestalt 2 of operation, the value of N is not concerned with the capacity of a record medium 4, but it is always fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 2 of operation.

[0056] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. A record medium 4 is beforehand divided into the field of a fixed number N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is secured at worst.

[0057] In this example, when CPU8 performs record or playback of a program 102 to the zone 103 of arbitration, the positional information (address information of a record medium 4) of each zone 103 is needed, but when it chooses so that the size of each zone 103 may become equal, it can ask by the simple operation from the number N of the zone 101 beforehand decided to be the capacity of a record medium 4.

[0058] With the gestalt 4 of operation, in order that the value of N may not be dependent on the capacity of a record medium 4, the number of trains of the zone number train 142 in the program zone table 141 becomes fixed. Thus, by making the number of zones 103 regularity, the table size of a file system 41 is not concerned with the capacity of a record medium 4, but becomes always fixed. For example, since it is necessary to hold information also at the time of the power off of a digital-broadcasting receiver, it is necessary to record a file system 41 on nonvolatile memory etc. but, and even when a record medium 4 is exchanged and capacity increases, since the size of a file system 41 does not increase, it does not need to extend memory space.

[0059] Gestalt 5. drawing 5 of operation shows the gestalt 5 of implementation of this invention, and 51 is a file system by the gestalt of this operation in drawing. Moreover, for the zone table on which the zone where 104 divided the record medium 4, and 151 constitute a file system 51, and 152, as for a program number train and 154, a zone number index and 153 are [a chain information train and 155] zone property trains, and others are the same as that of the gestalt 1 of operation.

[0060] Here explains actuation of the gestalt 5 of operation. The record medium 4 is beforehand divided into the zone 104 of N individual, and one zone 104 is constituted so that the single program 102 may be recorded. Unlike the gestalt 1 of operation, the size of each zone 104 is not fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 1 of operation.

[0061] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. A record medium 4 is beforehand divided into the field of N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is secured at worst.

[0062] Therefore, the data transfer performance of record or playback is secured, namely, in order to secure a data continuity, the larger one is advantageous [area size]. However, when the data of a program 102 do not fulfill one field (zone 104) with one side, in order that the surplus in a field may serve as an invalid-data field which is not used and may reduce the utilization ratio of a record medium 4 as a result, from the field of recording efficiency, the smaller one is desirable [a surplus / zone 104 size].

[0063] For example, in the case of a hard disk etc., on the periphery of a platter, it has a high data transfer rate, but in inner circumference, it is that a data transfer rate falls in most cases. The data transfer rate means the data transfer rate between the platter except overheads, such as head transit time, and a head here. Therefore, a lower part needs to secure the continuity of data more and the data transfer rate of a record medium 4 needs to lessen an overhead for it. With the gestalt of this operation, the data transfer rate is divided by the lower part so that the size of a zone 104 may become large. That is, the size of each zone 104 is selected by the size which was in inverse proportion to the data transfer rate in general. Thus, according to the data transfer rate of a record medium 4, the data transfer performance and recording efficiency of record or playback can be reconciled by choosing the size of each zone 104 the optimal.

[0064] In this example, when CPU8 performs record or playback of a program 102 to the zone 104 of arbitration, unlike the gestalt 1 of operation, it becomes difficult to search for the positional information (address information of a record medium 4) of each zone 104 by the simple operation. In that case, before indicating a starting address, an ending address, etc. of each zone 104 as an attribute in the zone property train 155 of the zone number index 152 corresponding to each zone 104 in the zone table 151 and performing record or playback to the zone 104 of arbitration, address information can be obtained by referring to the zone property train 155.

[0065] Gestalt 6. drawing 6 of operation shows the gestalt 6 of implementation of this invention, and sets it to drawing. 61 The file system by the gestalt of this operation and 163 The program zone table in which the zone which divided the record medium 4, and 161 showed the relation between a program 102 and a zone 104, and 162 The zone number train corresponding to a zone 104 in the program number index corresponding to a program 102 and 163 and 164 are program property trains, 165 is a zone property train, and others are the same as that of the gestalt 2 of operation.

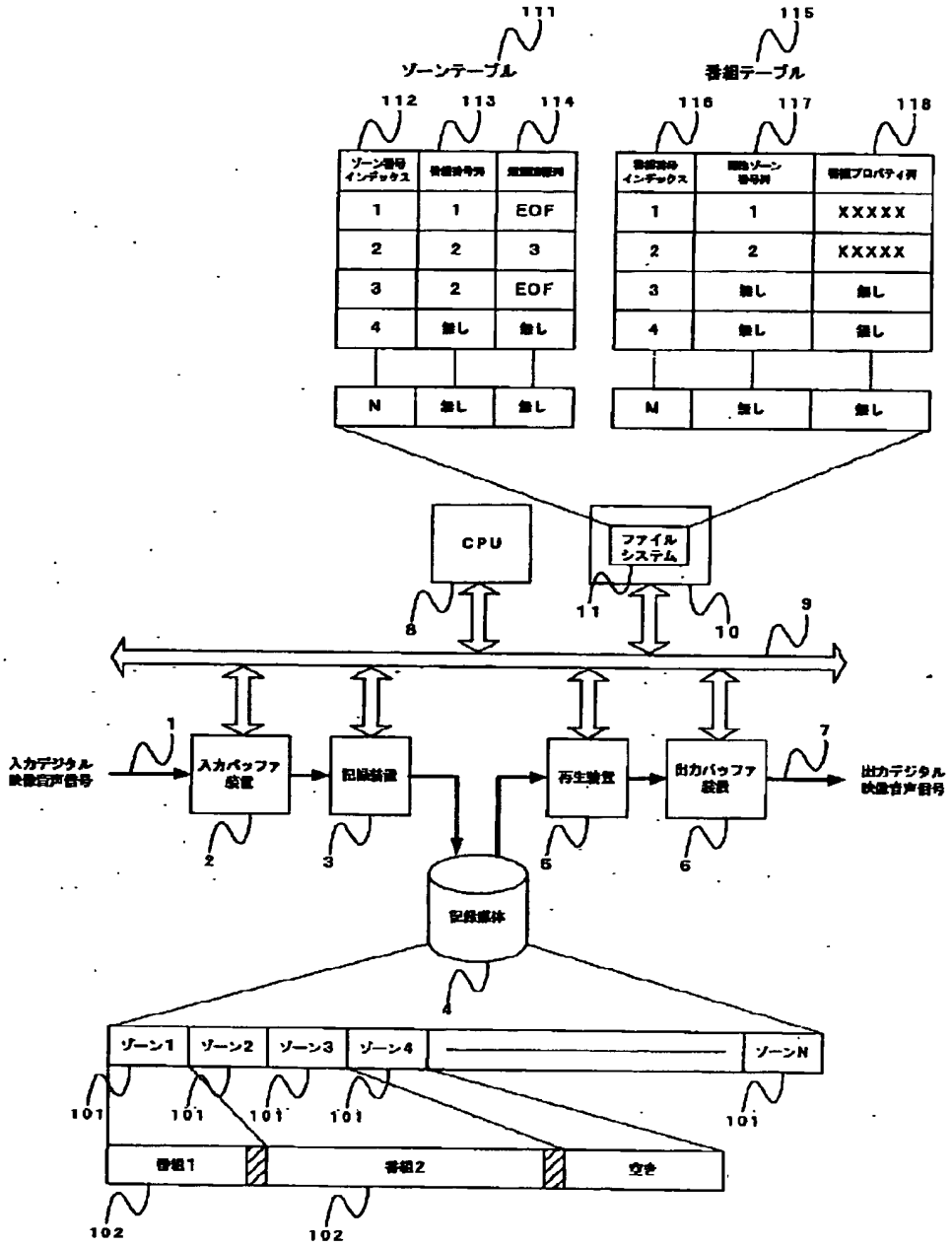
[0066] Here explains actuation of the gestalt 6 of operation. The record medium 4 is beforehand divided into the zone 104 of N individual, and one zone 104 is constituted so that the single program 102 may be recorded. Unlike the gestalt 2 of operation, the size of each zone 104 is not fixed. Record of the program 102 over a record medium 4, playback, and elimination actuation are the same as that of the gestalt 2 of operation.
[0067] In the record medium 4 which generally used disk media, since the overhead to which a head is moved decreases so that the continuity of data is secured, the data transfer performance of record or playback improves. The record medium 4 is beforehand divided into the field of N individual, and even when record and elimination are repeated by using as a record unit of a program 102, the data continuity for one field is secured at worst.
[0068] Therefore, the data transfer performance of record or playback is secured, namely, in order to secure a data continuity, the larger one is advantageous [area size]. However, when the data of a program 102 do not fulfill one field (zone 104) with one side, in order that the surplus in a field may serve as an invalid-data field which is not used and may reduce the utilization ratio of a record medium 4 as a result, from the field of recording efficiency, the smaller one is desirable [a surplus / area size].
[0069] For example, in the case of a hard disk etc., on the periphery of a platter, it has a high data transfer rate, but in inner circumference, it is that a data transfer rate falls in most cases. The data transfer rate means the data transfer rate between the platter except overheads, such as head transit time, and a head here. Therefore, a lower part needs to secure the continuity of data more and the data transfer rate of a record medium 4 needs to lessen an overhead for it. With the gestalt of this operation, the data transfer rate is divided by the lower part so that the size of a zone 104 may become large. That is, the size of each zone 104 is selected by the size which was in inverse proportion to the data transfer rate in general. Thus, according to the data transfer rate of a record medium 4, the data transfer performance and recording efficiency of record or playback can be reconciled by choosing the size of each zone 104 the optimal.
[0070] In this example, when CPU8 performs record or playback of a program 102 to the zone 104 of arbitration, unlike the gestalt 2 of operation, it becomes difficult to search for the positional information (address information of a record medium 4) of each zone 104 by the simple operation. In that case, before indicating a starting address, an ending address, etc. of each zone as an attribute in the zone property train 165 of the zone number train 163 corresponding to each zone 104 in the program zone table 161 and performing record or playback to the zone 104 of arbitration, address information can be obtained by referring to the zone property train 165.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram of the digital-broadcasting receiver with a built-in record regenerative function by the gestalt 1 of operation of this invention.
[Drawing 2] It is the block diagram of the digital-broadcasting receiver with a built-in record regenerative function by the gestalt 2 of operation of this invention.
[Drawing 3] It is the block diagram of the digital-broadcasting receiver with a built-in record regenerative function by the gestalt 3 of operation of this invention.
[Drawing 4] It is the block diagram of the digital-broadcasting receiver with a built-in record regenerative function by the gestalt 4 of operation of this invention.
[Drawing 5] It is the block diagram of the digital-broadcasting receiver with a built-in record regenerative function by the gestalt 5 of operation of this invention.
[Drawing 6] It is the block diagram of the digital-broadcasting receiver with a built-in record regenerative function by the gestalt 6 of operation of this invention.
[Drawing 7] It is the block diagram of the conventional record regenerative apparatus.
[Description of Notations]
1 Input Digital Image Sound Signal, 2 Input-Buffer Equipment, 3 Recording Device, 4 A record medium, 5 A regenerative apparatus, 6 Output-buffer equipment, 7 Output digital image sound signal, 8 CPU, 9 A CPU bus, 10 A memory apparatus, 11 File system, 21 A file system, 31 A file system, 41 File system, 51 A file system, 61 A file system, 101 Zone, 102 programs, 111 A zone table, 112 Zone number index, 113 A program number train, 114 A chain information train, 115 Program table, 116 A program number index, 117 An initiation zone number train, 118 Program property train, 121 A program zone table, 122 Program number index, 123 A zone number train, 124 A program property train and 131 Zone table, 132 A zone number

index, 133 A program number train, 134 chain information trains, 141 A program zone table, 142 Program number index, 143 A zone number train, 144 A program property train, 151 Zone table, 152 A zone number index, a 153 program number train, 154 chain information trains, 155 A zone property train, 161 A program zone table, 162 Program number index, 163 A zone number train, 164 A program property train, 165 Zone property train, 701 A microprocessor, 702 Main memory, 703 Bus bridge, 704 An I/O interface, 705 Secondary memory interface, 706 A hard disk, 707 MPEG real-time encoder board, 708 AV processing circuit, 709VRAM, 710 File table, 711 A cluster table, a 712 file-name index, 713 An extension train, 714 The 1st cluster train, a 715 entry number index, 716 FAT ID train, 717 Cluster number train

【図1】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記録装置
再生装置
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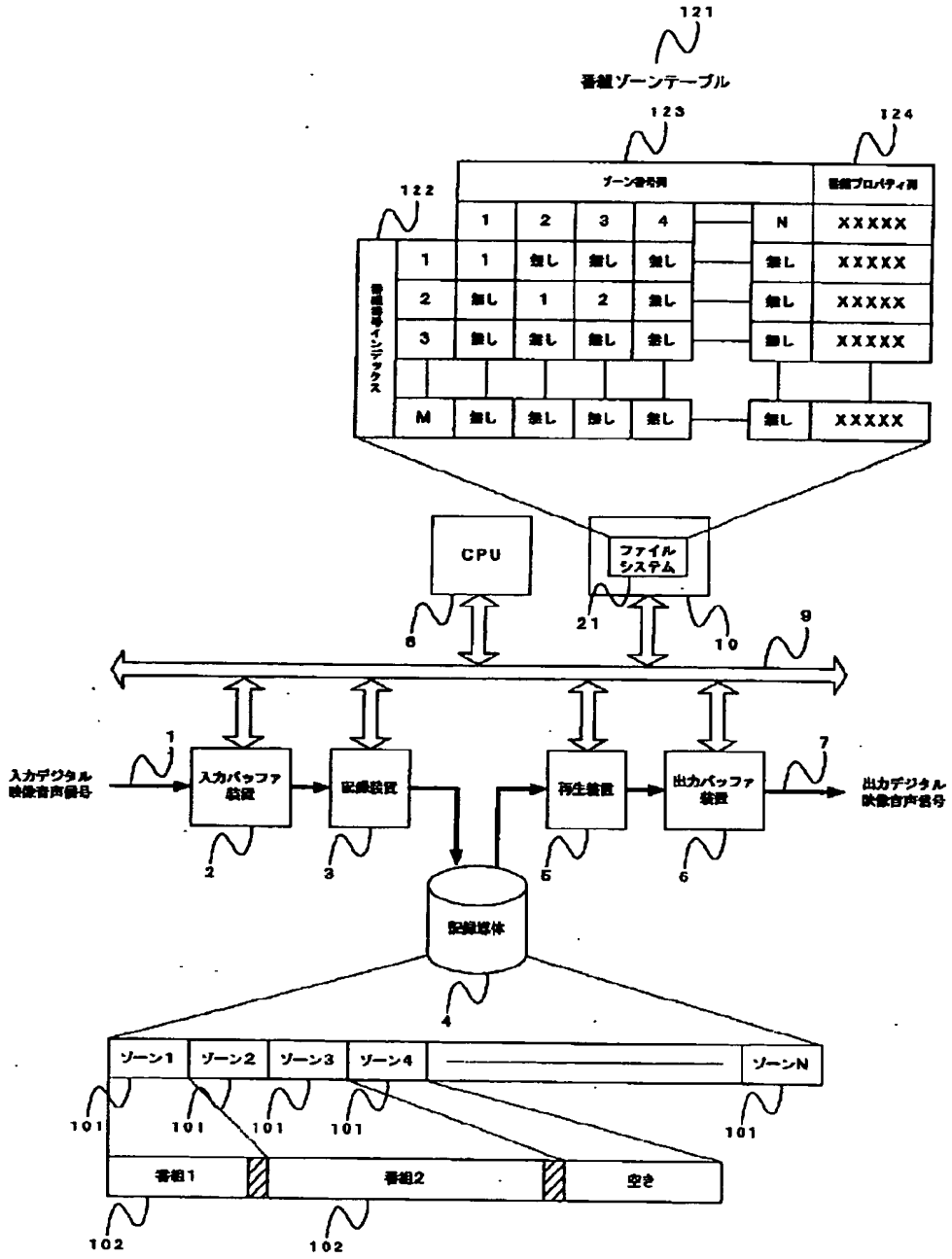
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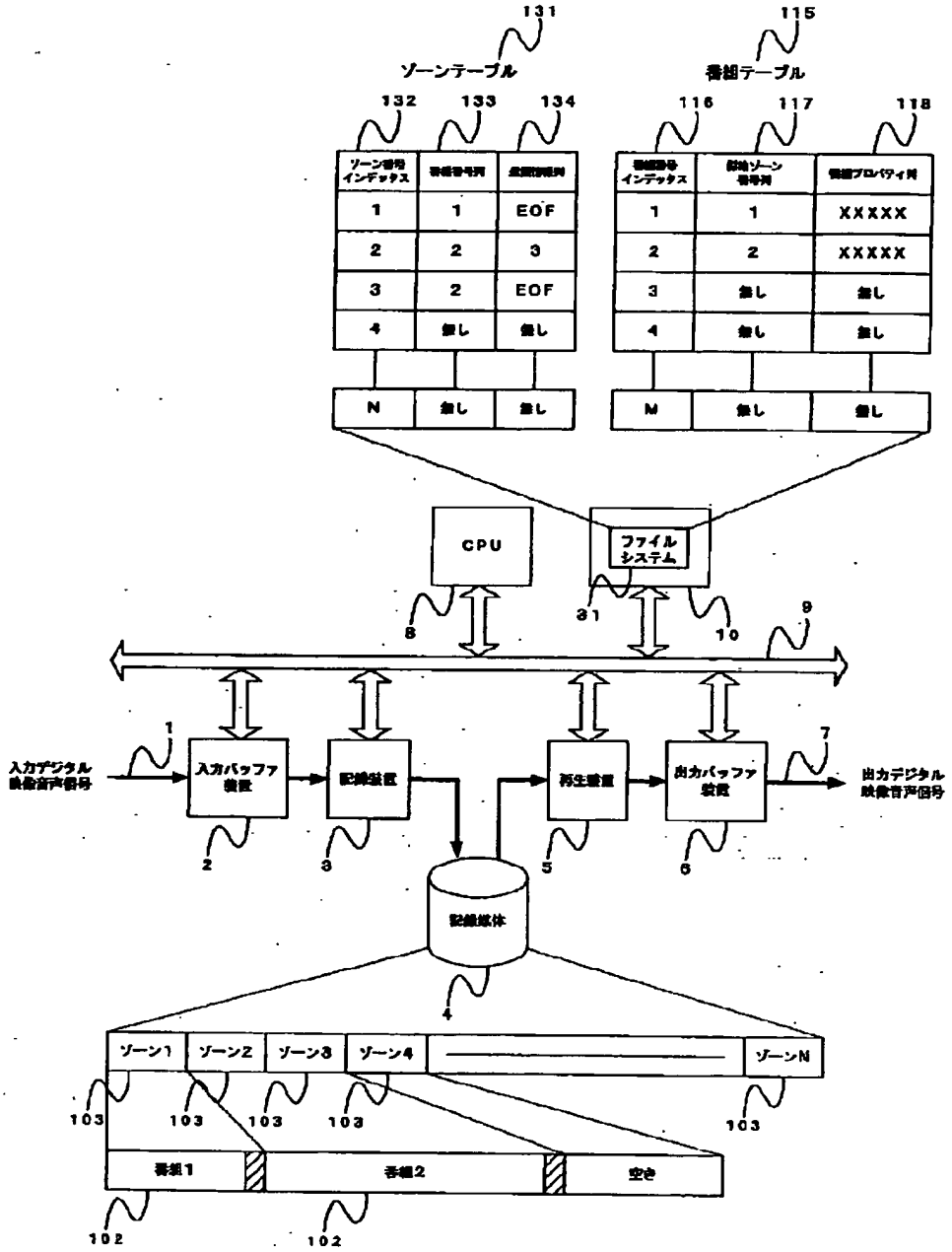
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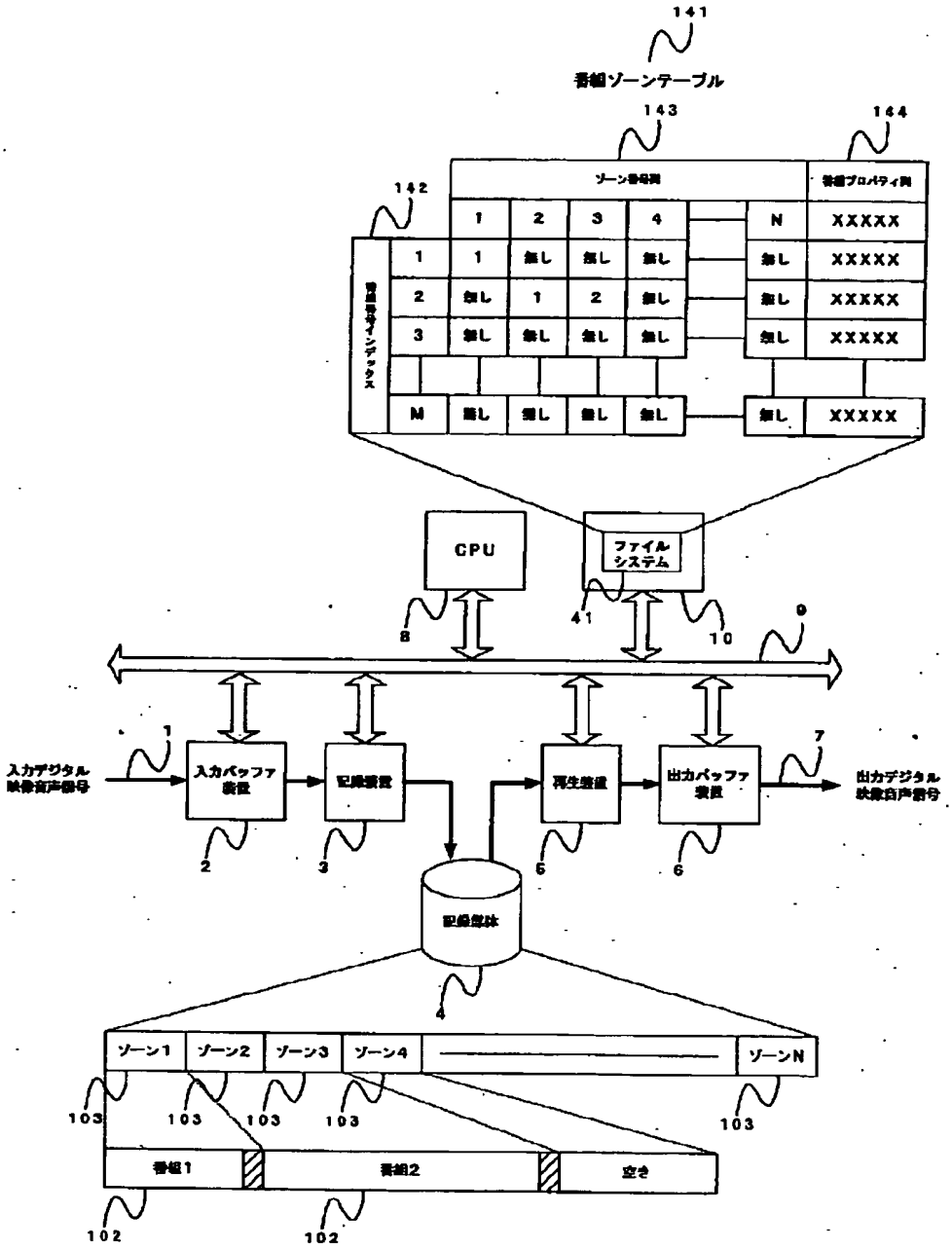
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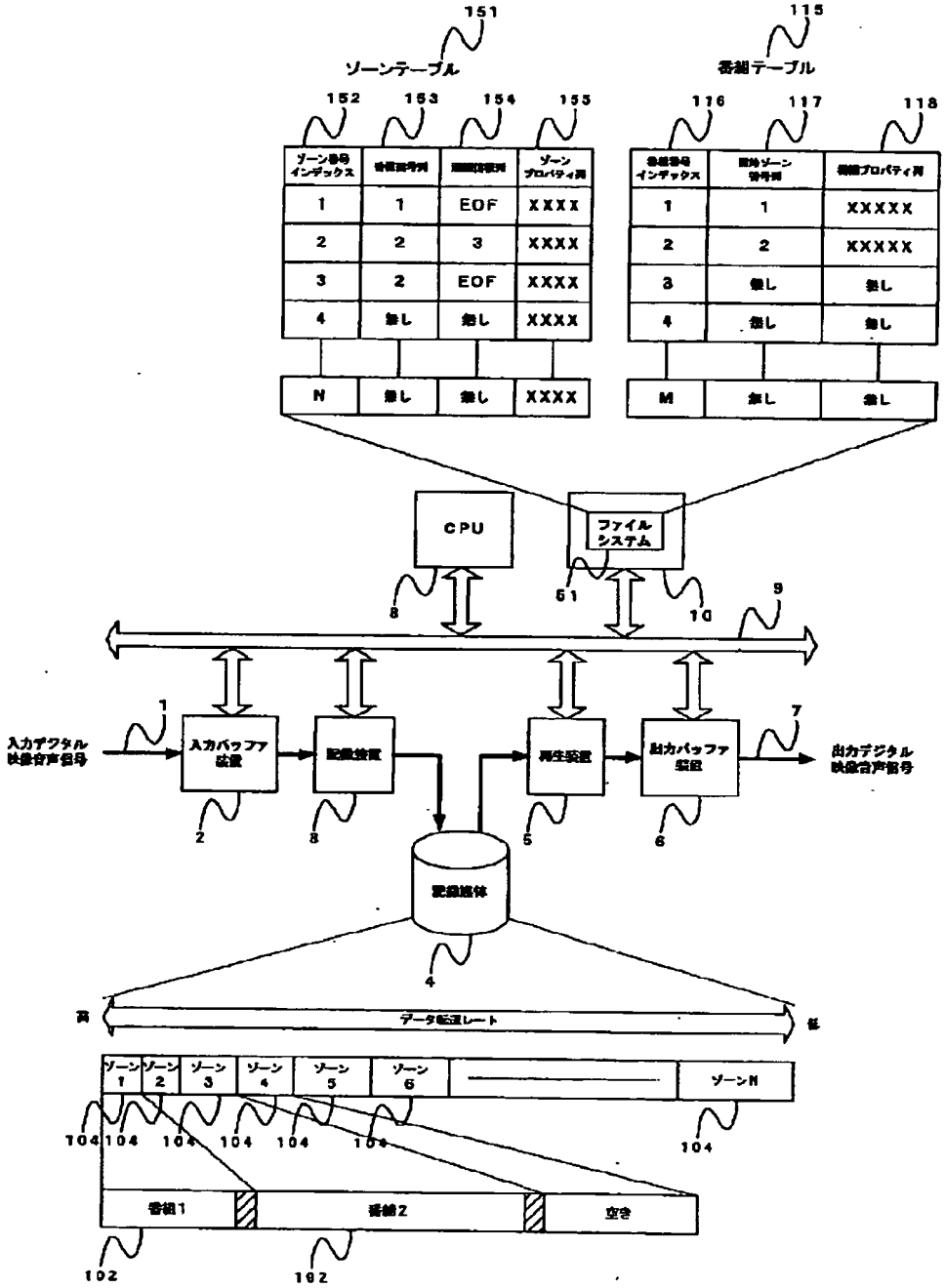
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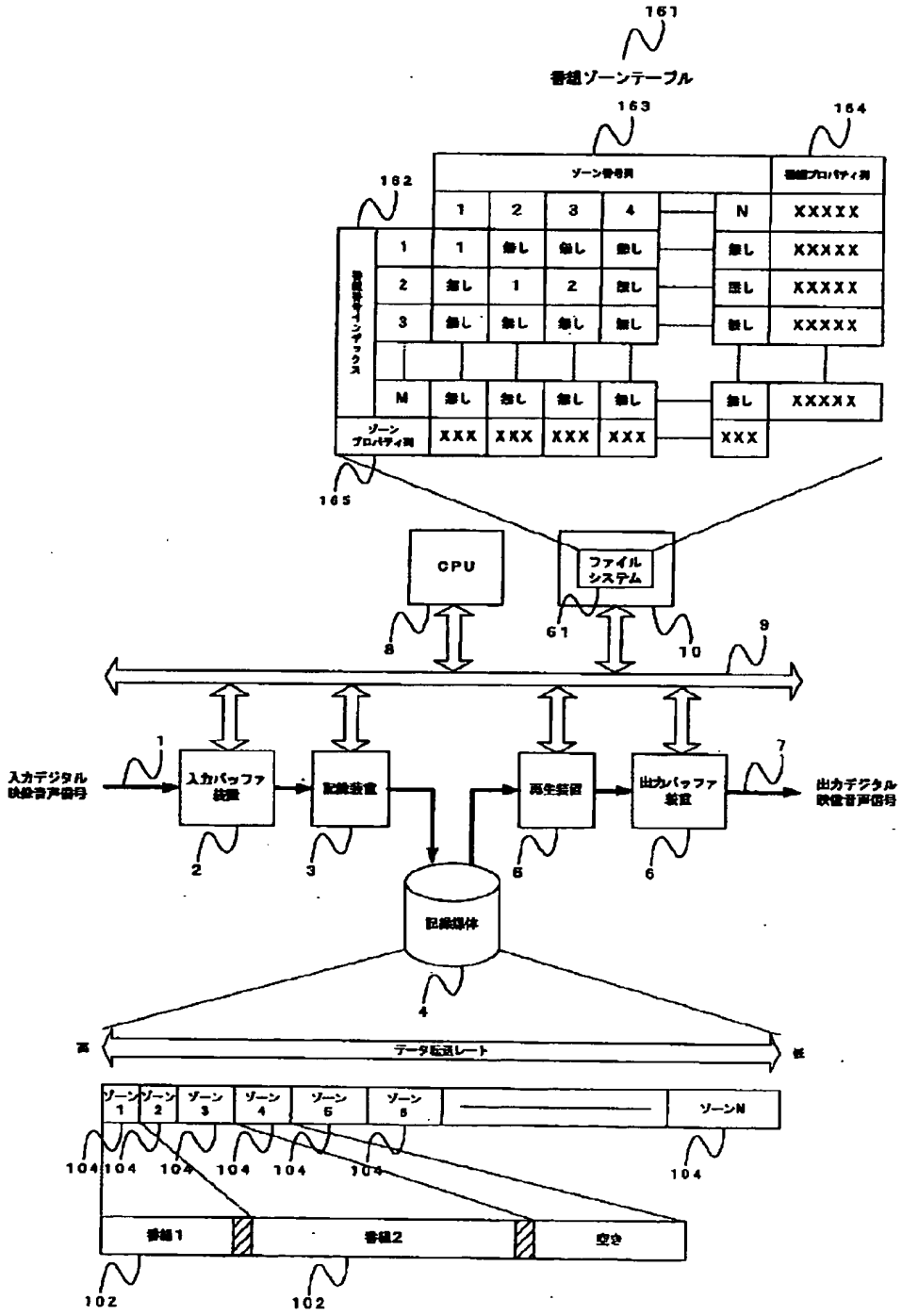
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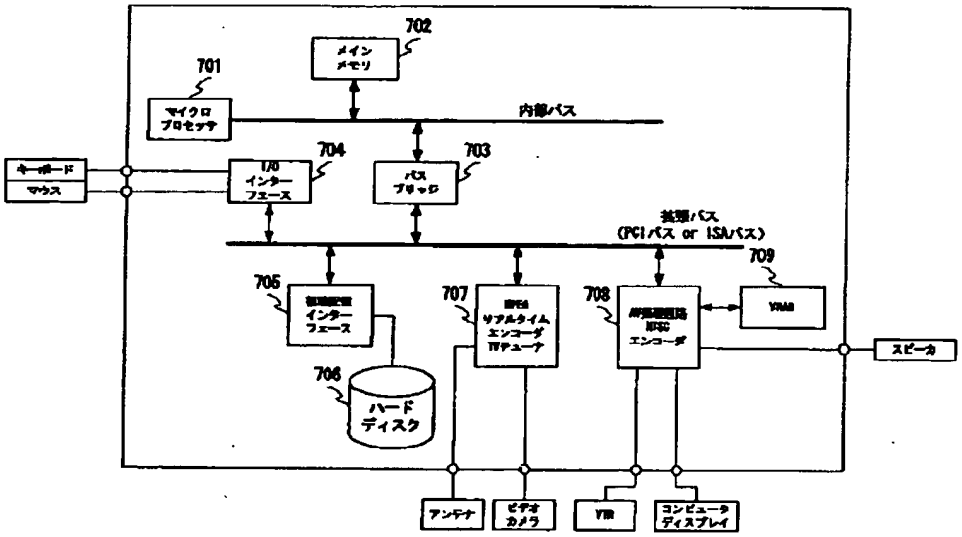

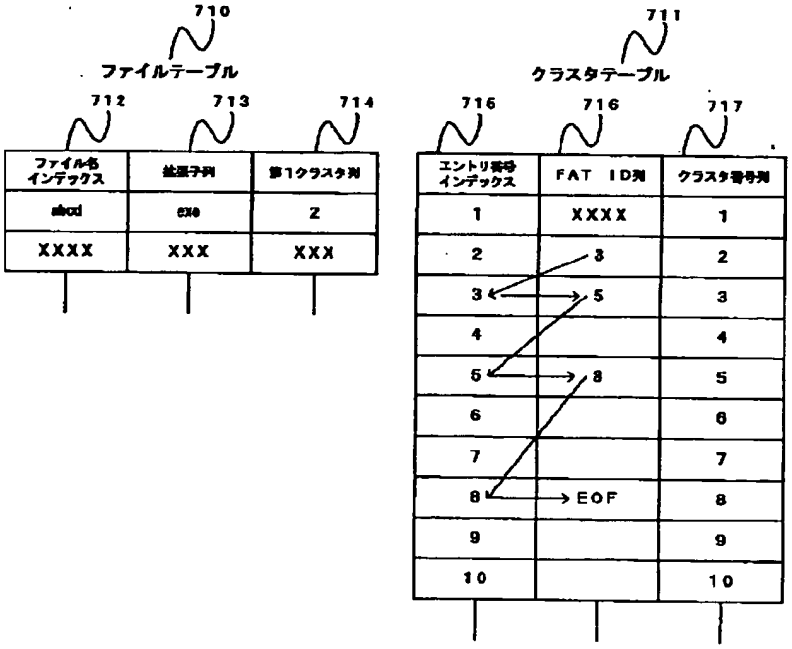

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5/781		5/92	H	

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5C053 FA23 FA27 GB05 GB38 JA24
KA24 LA07
5D044 AB05 AB07 BC06 CC04 DE02
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